Public Works Department
Province of Bombay

Irrigation Administration Report

Province of Bombay

Part I

For the Year 1937-38

BOMBAY
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1939

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MAP OF THE PROVINCE OF BOMBAY

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT FOR 1937-38

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NORTHERN CIRCLE

AHMEDABAD DIVISION

AHMEDABAD DISTRICT

KAIRA DISTRICT

KAIRA & PANCH MAHALS DIVISION

PANCH MAHALS DISTRICT

KAIRA DISTRICT

SURAT & BROACH DIVISION

BROACH DISTRICT

SURAT DISTRICT

CENTRAL CIRCLE

SATARA DIVISION

SATARA DISTRICT

SHOLAPUR DIVISION

SHOLAPUR DISTRICT

NASIK DIVISION

KHANDESH DIVISION

WEST KHANDESH DISTRICT

EAST KHANDESH DISTRICT

DECCAN IRRIGATION CIRCLE

NASIK IRRIGATION DIVISION

NASIK DISTRICT

AHMEDNAGAR DISTRICT

AHMEDNAGAR DIVISION

AHMEDNAGAR DISTRICT

POONA IRRIGATION DIVISION

POONA DISTRICT

NIRA RIGHT BANK CANAL DIVISION

POONA DISTRICT

SATARA DISTRICT

SHOLAPUR DISTRICT

SOUTHERN CIRCLE

BELGAUM DIVISION

BELGAUM DISTRICT

DHARWAR DIVISION

DHARWAR DISTRICT

BIJAPUR DISTRICT

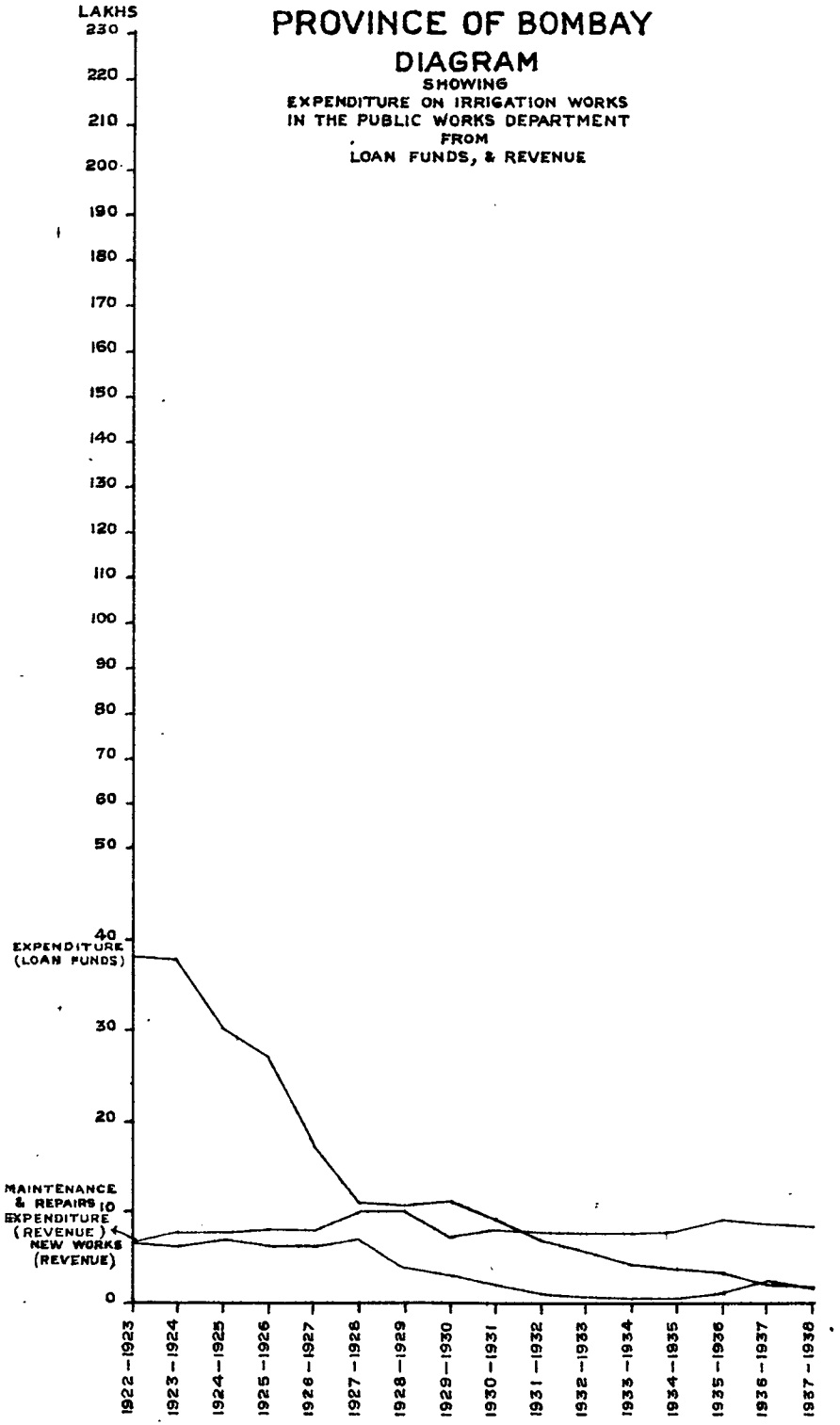
KANARA DIVISION

KANARA DISTRICT

PROVINCE OF BOMBAY

DIAGRAM

SHOWING
EXPENDITURE ON IRRIGATION WORKS
IN THE PUBLIC WORKS DEPARTMENT
FROM
LOAN FUNDS, & REVENUE



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PROVINCE OF BOMBAY

DIAGRAM SHOWING EXPENDITURE

ON ESTABLISHMENT

IN THE

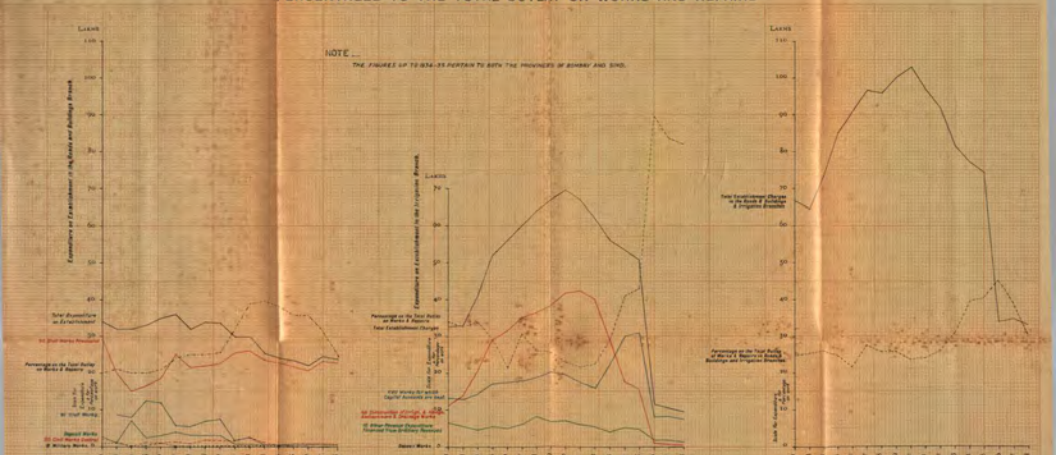
ROADS & BUILDINGS & IRRIGATION BRANCHES

OF THE

PUBLIC WORKS DEPARTMENT

AND

PERCENTAGES TO THE TOTAL OUTLAY ON WORKS AND REPAIRS



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IRRIGATION ADMINISTRATION REPORT, PROVINCE OF BOMBAY, PART I 1937-38

PHYSICAL FEATURES—GENERAL DESCRIPTION OF IRRIGATION.

The area under irrigation in the Province of Bombay is not compact. Rainfall is available for agricultural operations but is often precarious. Tanks and canals provide irrigation for valuable crops such as sugarcane and also provide a source of supply to other crops when the rainfall is deficient or irregular. The old irrigation works consist chiefly of a few small canals and moderately large tanks, some 12,000 smaller tanks mostly in the southern part of the Province and in Gujarat, and of about 400 bandharas in Nasik and Khandesh Districts. The tanks have earthen dams and the larger ones irrigate areas up to 1,300 acres, and the smaller ones up to 500 acres, situated immediately below the dams. The chief crop irrigated is rice. The bandharas are masonry weirs built across rivers to head up the water to a level sufficient to irrigate lands on the banks of the streams by means of channels taking off from the flanks of the bandharas. The areas irrigated are up to 800 acres and the chief crops are sugarcane, wheat, bajri and gram. From these small beginnings have evolved the magnificent irrigation works, which now form such a conspicuous feature in the Deccan and have so successfully fulfilled their beneficent purpose in banishing the famines which formerly devastated this portion of the Province.

2. The irrigation works in the Deccan are fundamentally different from those in Sind, the Punjab, Egypt or Mesopotamia, where wide alluvial plains have been formed by great deltaic rivers in perennial flow. The Bombay Deccan consists of a sloping table-land running eastward from the ridge of the Western Ghats. These form a ridge running parallel to the sea-coast at a distance from it of 50 to 100 miles; precipitous on the western side, they fall away more gradually to the east. The heaviest rainfall occurs on the peak of the ridge, where anything up to 270 inches of rain is recorded in the four monsoon months. The intensity of the rainfall rapidly decreases as we go eastward from the highest ridge, reaching a figure of 20 or 25 inches at a distance of 100 or 150 miles east of the Ghats. The rivers in the Deccan rise in the valleys close to the ridge, flow in an eastward direction, and are dry or practically so for 7 or 8 months of the year. The line of the Ghats, like the ridge of a roof, divides the rainfall into two parts; one the smaller portion falling westward into the Indian Ocean, and the other flowing through long lengths of tortuous rivers to the east and joining the rivers, which reach the sea on the south-eastern coast of the peninsula. These rivers are in flow during the

monsoon months only, and if no artificial means of conserving their waters were provided, the whole monsoon rainfall would be wasted so far as the Bombay Deccan is concerned, and would simply flow away to the sea, benefiting but to a small extent the country traversed.

3. The large irrigation systems in the Deccan are all of the same type. Each depends upon a storage lake near the head of one of the river valleys, where sufficient water is collected during the monsoon to supply the country on either side of the river valley below. The water stored during the rains is let out during the dry months of the year in accordance with requirements; and at a point on the river, which may be as far as 50 miles from the main storage lake, a "pick-up-weir" is constructed across the river-course to divert the water into canals which take off on either side of the weir. In one case only, that of Lake Fife at Khadakwasla near Poona, do the canals take off from the flanks of the dam itself. The canals are always constructed at a considerably flatter slope than that of the river, and consequently are able to diverge from the river itself on each side of the valley; as a rule each canal only irrigates the area between itself and the river.

SECTION I

COMPRISING IRRIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

Works in operation. 4. The following list includes all the works in operation (43 in number) :—

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
1	Hathmati and Khari Cut Canals.	24,000	Dependent on local rain.	No storage work. Bokh reservoir, Chandola tank and Wasai reservoir completed.	The catchment of the Hathmati river is hilly, covered partly with forest and that of the Khari is undulating ground at its source and then plain ground with cultivated fields. The supply depends upon the flow in the rivers, and the contents of the Bokh reservoir, Chandola tank and Wasai reservoir.
2	Wangroli Tank ..	3,400	Do. ..	Completed ..	The catchment is ordinary plain ground and cultivated fields.
3	Savli Tank ..	3,000	Do. ..	Do. ..	Ordinary catchment on undulating ground.
4	Saiat Tank ..	2,000	Do. ..	Do. ..	Ordinary catchment on flat ground.
5	Tranza Nagrama Tanks	800	Do. ..	Do. ..	The Tranza tank has no independent catchment. The Nagrama has a catchment of 1·5 sq. miles. Both are fed by the Matar drainage channel which is not reliable as it seldom flows.
6	Futelao Tank ..	800	Do. ..	Do. ..	Hilly catchment.
7	Nira Left Bank Canal including Shetphal Tank.	100,000	Reliable ..	Lake Whiting (Lloyd Dam) completed.	Ghat catchment.
8	Nira Right Bank Canal	180,000	Do. ..	Do. ..	Do.
9	Mutha Canals including Matoba Tank.	49,000	Do. ..	Lake Fife completed.	Do.
10	Kasurdi Tank ..	40	Dependent on local rain.	Completed ..	Deccan catchment.

Serial Number.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
11	Shirsuphal Tank ..	1,150	Dependent on local rain.	Completed ..	Deccan catchment.
12	Bhadalyadi Tank ..	1,225	Do. ..	Do. ..	Do.
13	Godavari Right Bank Canal.	44,000	Reliable ..	Lake Beale completed.	Ghat catchment.
	Godavari Left Bank Canal.	26,000			
14	Girna Canal ..	9,000	Do. ..	Chankapur Tank completed.	Do.
15	Kadwa River Works. Palkhed Canal. Ojhar Tambat Canal. Wadali Canal.	7,689	Do. ..	Waghad Tank completed.	Do.
16	Pravara Right Bank Canal.	18,480	Do. ..	Lake Arthur Hill (Wilson Dam) completed.	Do.
	Pravara Left Bank Canal.	64,080			
17	Bhatodi Tank ..	1,461	Dependent on local rain.	Completed ..	Deccan catchment.
18	Ekruk Tank ..	13,070	Do. ..	Do. ..	Do.
19	Mhaswad Tank ..	14,000	Do. ..	Do. ..	Do.
20	Koregaon Tank ..	416	Do. ..	Do. ..	Hilly catchment.
21	Ashti Tank ..	3,382	Do. ..	Do. ..	Deccan catchment.
22	Pathri Tank ..	3,094	Do. ..	Do. ..	Hilly catchment.
23	Jamda Canals ..	42,000	Girna river supply not reliable.	Water is issued from the Chankapur Tank when available.	Ghat catchment for a small part and for the rest Deccan catchment.
24	Hartala Tank ..	978	Dependent on local rain.	Completed ..	Deccan catchment.
25	Mhaswa Tank ..	3,256	Do. ..	Do. ..	Do.
26	Shahada Channel ..	2,000	Reliable ..	No storage work ..	Hilly catchment. Supply is perennial.
27	Lower Panjhra River Works.	8,173	Panjhra river supply not reliable.	Mukti Tank completed.	Ghat catchment for one part and Deccan catchment for the rest.
28	Krishna Canal ..	6,412	Reliable ..	Proposed ..	Ghat catchment.
29	Rewari Canal ..	439	Dependent on local rain.	No storage work ..	Deccan catchment.

Serial No.	Name of Work.	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec.	Whether supply is reliable or dependent on local rain.	Whether storage works completed or proposed.	Remarks.
		Acres.			
30	Upper Man River Works.	373	Dependent on local rain.	Pingli Tank completed.	Deccan catchment.
31	Yerla River Irrigation Works.	1,182	Do. ..	Nehr Tank completed.	Do.
32	Chikhli Canal ..	358	Do. ..	No storage work ..	Do.
33	Maini Tank ..	455	Do. ..	Completed ..	Do.
34	Parsul Tank ..	1,440	Do. ..	Do. ..	Do.
35	Gadikeri Tank ..	416	Do. ..	Do. ..	Do.
36	Gokak Canal ..	17,627	Reliable ..	27' completed ..	Ghat catchment.
37	Muchkundi Tank ..	750	Dependent on local rain.	Completed ..	Deccan catchment.
38	Dambal Tank ..	531	Do. ..	Do. ..	Do.
39	Medleri Tank ..	231	Do. ..	Do. ..	Do.
40	Madag Tank ..	1,418	Do. ..	Do. ..	Ghat and Forest catchment.
41	Asundi Tank	503	Do. ..	Do. ..	Deccan catchment.
42	Dharma Canal ..	For monsoon season 6,580 acres. For rabi nil.	Do. ..	No storage work. The canal takes off from the river itself.	Forest catchment.
43	Mavinkop Tank ..	617	Do. ..	Completed ..	Do.

Ekruk tank, Gadikeri tank, Mavinkop tank and Shahada channel are the only productive works and the rest are unproductive.

5. The interest account for the year was as follows :—

—	Productive Works.	Unproductive Works.	Total.
	Rs.	Rs.	Rs.
Total interest charges during 1937–38 ..	46,361	41,15,744	41,62,105
Net revenue realised during 1937–38 ..	1,41,228	14,68,148	16,09,376

Net loss, i.e., difference between interest and net revenue—Rs. 25,52,729.

6. The financial results of the year by main heads were as under :—

	Area irrigated.	Revenue realised.			Working expenses.	Net revenue.
		Direct receipts.	Share of land revenue.	Total.		
	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	6,992	1,58,516	9,986	1,68,502	27,274	1,41,228
Unproductive	309,593	30,56,409	10,984	30,67,393	15,99,245	14,68,143
Total ..	*316,585	32,14,925	20,970	32,35,895	16,26,519	16,09,376

*Inclusive of 8,622 acres under consolidated assessment.

The gross revenue and the net revenue show increases of Rs. 1,69,254 and Rs. 2,72,665, respectively, as compared with the figures for the previous year.

Area irrigated, revenue, etc.

7. The figures of the area irrigated, the revenue assessed and realised and the working expenses, as compared with those of the previous three years, are given below :—

Year.	Area irrigated*.	Revenue.		Working expenses.
		Assessment.	Realisations.	
	Acres.	Rs.	Rs.	Rs.
1934-35	214,253	25,66,862	29,96,085	15,45,418
1935-36	214,303	28,03,346	28,30,067	17,23,000
1936-37	313,973	34,77,222	30,66,641	17,29,930
Average ..	247,509	29,49,143	29,64,264	16,66,116
1937-38	316,585	33,83,235	32,35,895	16,26,519

*Inclusive of the area under consolidated water and land assessment.

8. The gross area under command is 1,799,000 acres. The area irrigable at present is 626,000 acres.

9. The state of Revenue collections was as follows :—

		Rs.
Balance of demands unrealised at the commencement of the year		16,74,125
Demands of the year—	Rs.	
Rabi, 1936–37	6,43,143	
Kharif, 1937–38	22,98,061	
Miscellaneous receipts	4,83,290	
		34,24,494
Total		50,98,619
Deduct—		
Remissions		17,765
Net total		50,80,854
Amount unrealised at the close of the year		18,45,858
	Rs.	
Actual receipts of the year	32,34,996	
Add—		
Share of land revenue	20,970	
		32,55,966
Deduct—		
Refunds of revenue		20,071
Revenue realised		32,35,895

The remissions and refunds together amounted to Rs. 37,836.

Unrealised irrigation revenue at the close of the year amounted to Rs. 18,45,858 which is made up as follows :—

	Rs.
Ekruk Tank	4,879
Hathmati and Khari Cut Canals	31,628
Krishna Canal	66,672
Ashti Tank	7,265
Lower Panjhra River Works	7,936
Mutha Canals and Matoba Tank	1,32,886
Gokak Canal	24,976
Mhaswad Tank	20,070
Jamda Canals	8,890
Pathri Tank	4,530
Nira Left Bank Canal and Shetphal Tank	5,37,289
Chankapur Tank—Girna Canal	79,050
Kadwa River Works	80,958
Godavari Canals	1,57,549
Nira Right Bank Canal	4,43,358
Pravara River Works	2,04,404
Other Works	33,518
Total	18,45,858

Working expenses.

10. The working expenses of the year amounted to Rs. 16,26,519 as compared with Rs. 17,29,930 during the previous year. The following table compares the charges under the principal heads with those of the previous three years :—

——	1934-35.	1935-36.	1936-37.	1937-38.
	Rs.	Rs.	Rs.	Rs.
Works	38,862	67,604	1,85,616	1,44,956
Repairs	5,56,315	6,64,485	5,93,823	5,80,762
Establishment	8,69,891	9,11,468	8,68,902	8,14,161
Tools and Plant	9,177	10,078	8,805	7,914
Total in the Public Works Department ..	14,74,245	16,53,635	16,57,146	15,47,793
Collection charges ..	65,228	62,049	64,992	71,472
Indirect charges	5,945	7,316	7,792	7,254
Total working expenses ..	15,45,418	17,23,000	17,29,930	16,26,519

Details of working expenses.

11. The following table gives the details of working expenses for some of the principal works :—

Name of work.	Average incidence of water rate per acre.	Cost of measurement.		Working expenses in the Public Works Department.	
		Total cost.	Per acre.	Per mile of canal.	Per acre irrigated.
	Rs.	Rs.	Rs. a. p.	Rs.	Rs.
Nira Left Bank Canal and Shetphal Tank	9·37	1,421	0 0 5	850	2·67
Pravara Canals	13·36	1,471	0 0 11	1,656	9·79
Girna Canal	8·71	597	0 0 11	1,202	4·53
Godavari Canals	12·59	1,621	0 1 2	1,099	7·04
Mutha Canals and Matoba Tank ..	8·10	950	0 0 11	598	5·88
Kadwa River Works	18·96	327	0 1 0	810	6·30
Nira Right Bank Canal	9·78	1,704	0 0 8	671	7·24
Mhaswad Tank	4·30	162	0 0 10	193	4·08
Krishna Canal	9·15	445	0 1 7	1,207	9·80
Yerla River Irrigation Works ..	5·32	437	0 2 1	321	3·18
Upper Man River Works ..	5·33	51	0 0 9	266	4·32
Jamda Canals	6·91	67	0 0 9	129	10·67
Ekruk Tank	6·18	169	0 0 9	377	4·29
Maini Tank	4·41	64	0 0 8	436	2·67
Gokak Canal	5·40	654	0 1 0	240	1·22
Dharma Canal	5·85	176	0 5 6	67	0·30

Gross assessed revenue.

12. The gross assessed revenue, direct and indirect, amounted to Rs. 33,83,235 as compared with Rs. 34,77,222 in the previous year. The details of the gross assessment are as under :—

	Direct revenue.			Indirect revenue.	Total.
	Water rate.	Other receipts.	Total.		
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	31,476	1,24,553	1,56,029	9,986	1,66,015
Unproductive	28,47,499	3,58,737	32,06,236	10,984	32,17,220
Total ..	28,78,975	4,83,290	33,62,265	20,970	33,83,235

The net assessed revenue of the year, after deducting working expenses (Rs. 16,26,519), amounted to Rs. 17,56,716 as compared with Rs. 17,47,292 during the previous year.

13. The following table gives the percentage return earned during the year on capital outlay on the principal works in operation :—

	Total capital outlay (direct and indirect).	Gross receipts (direct and indirect).	Working expenses (direct and indirect).	Net Revenue.	Percentage return on capital outlay.
	Rs.	Rs.	Rs.	Rs.	Rs.
Ekruk Tank	13,40,386	1,53,095	18,101	1,34,994	10·07
Hathmati and Khari Cut Canals	13,18,729	1,05,330	37,915	67,415	5·11
Nira Left Bank Canal and Shetphal Tank ..	1,45,04,781	5,14,372	2,07,279	3,07,093	2·12
Nira Right Bank Canal ..	4,12,98,920	4,09,661	3,00,707	1,08,954	0·26
Mutha Canals and Matoba Tank	70,01,103	3,25,643	1,02,916	2,22,727	3·18
Godavari Canals ..	1,05,86,234	5,29,843	2,57,078	2,72,765	2·58
Chankapur Tank—Girna Canal	20,56,431	76,133	46,873	29,260	1·42
Kadwa River Works ..	10,35,876	45,500	29,960	15,540	1·50
Pravara River Works ..	1,50,51,286	7,75,679	4,35,480	3,40,199	2·26
Mhaswad Tank ..	20,96,016	19,745	12,812	6,933	0·33
Lower Panjhra River Works	4,68,621	22,353	3,617	18,736	4·00
Krishna Canal ..	9,49,807	39,304	42,540	—3,236	..
Gokak Canal	14,66,673	68,497	12,453	56,044	3·82

14. The average water rates per acre of land actually irrigated were :—

	Rs.
Productive works	6·85
Unproductive works	9·92

15. The water rate assessments and other receipts compare with those of the previous year as under :—

	1936-37.	1937-38.
	Rs.	Rs.
Water rates	29,67,572	28,78,975
Other receipts—		
Plantations	12,368	9,129
Water power	14,313	14,313
Miscellaneous	4,61,476	4,59,848
Total ..	4,88,157	4,83,290
Share of land revenue ..	21,493	20,970
Grand Total ..	34,77,222	33,83,235

16. The principal crop acreages irrigated during 1936-37 and 1937-38 are given below :—

Crop acreages.

	1936-37.	1937-38.
	Acres	Acres
Garden and orchards ..	7,002	7,502
Sugarcane	60,275	49,564
Wheat	16,065	11,062
Rice	2,205	20,920
Jowar	83,474	29,904
Bajri	18,475	15,484
Gram, etc.	11,695	17,081
Groundnut	17,847	29,256
Cotton	22,997	24,446
Condiments	6,799	9,542

The total estimated value of the crops irrigated was Rs. 206·06 lakhs compared with Rs. 183·20 lakhs during the previous year.

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

The year under review was marked by a good monsoon which broke in the last week of June and ended by the middle of September. The rainfall was little above the normal and of good intensity with the result that it was adequate for rice crops and for storage. There was good run-off from the catchments of the rivers. All the available flow in the Hathmati River was utilised in filling up the reservoirs and tanks and for rice transplantation. The transplanted area was protected by canal water and brought to maturity. The surplus water was utilised to protect the crops in the Rabi and Hot weather seasons. The total area protected by irrigation under the Hathmati and Khari Cut Canals including the area in the Kalambandhi villages of the Khari sluices system was about 26,299 acres.

The rainfall gauged at Ahmedabad and at Prantij was 39·56 and 41·69 inches, respectively, as compared with 25·27 and 23·81 inches, the average precipitation, respectively, of the last three years. Similarly at Bareja, which is situated in the centre of the area irrigated by the Khari Cut Canal, the rainfall was 36·61 inches as compared with 21·11 inches, the average of the last three years. At Himatnagar, where the Head Works of the Hathmati Canal are situated, it was 57·00 inches as compared with 26·74 inches, the average of the past three years.

The principal irrigation works in operation in this Circle are (1) the Hathmati and Khari Cut Canals, (2) the Wangroli Tank, (3) the Savli Tank, (4) the Saiat Tank, (5) the Tranza-Nagrama Tanks and (6) the Futelao Tank.

No. (1) is a work which includes the Bokh Storage Reservoir with a capacity of 300 million cubic feet of water and several small tanks with small independent catchments depending on local rainfall. The other works are storage tanks all depending on local rainfall.

The six works are financially unproductive, as the annual revenue is not sufficient to cover the working expenses.

AHMEDABAD AND KAIRA AND PANCH MAHALS DIVISIONS.

Hathmati and Khari Cut Canals.

This is the most important canal system in Gujarat. The Hathmati Canal irrigates a tract of land lying between the Sabarmati and Khari rivers and this system in addition to irrigating the area dependent on it, is designed to pass surplus water, when available, first into the Bokh Reservoir and then into the Khari River direct via the Bhujwa Channel. The Bokh Reservoir does not provide any direct irrigational supplies but only acts as a storage reservoir for the Khari Cut Canal. Further downstream on the Khari River are situated two small irrigation systems and these utilise the natural flow of the river and also any surplus water

which can be made available from the Hathmati canal ; the Khari water is abstracted at the so-called " Khari Sluices " for direct irrigational purposes, while the surplus water from the Hathmati is diverted through an artificial cut called " the Khari Cut " into a natural channel and this in its turn supplies a system of distributaries, several small tanks and the large Chandola Tank situated near Ahmedabad. The system was first opened in 1873-1874 and has cost more than Rs. 13 lakhs.

The Hathmati River was in flood on several occasions due to good rainfall in the catchment of the river. The floods were of long duration and of good volume. The greatest depth of water over the weir crest was 7·80 feet on 30th June 1937, when the discharge was 32,469 cusecs. The area irrigated under this canal was 1,747 acres in the Kharif season and 3,722 acres in the Rabi season. The average daily discharge admitted into the canal at its head during the Kharif season was 191 cusecs of which quantity only 66 cusecs were utilised for irrigation carried out under the canal, the balance being let down into the Bokh Reservoir and the Bhujwa Channel for supply to irrigation carried out under the Khari Cut Canal and for filling up the reservoirs and tanks situated thereunder. During the Rabi season an average daily discharge of 109 cusecs was obtained from the river, of which quantity 95 cusecs were utilised for irrigational purposes, and the remaining 13 cusecs were used in filling the Bokh Reservoir.

The Khari River rose in flood on several occasions due to good rainfall during the season. The floods were of long duration and of fairly good volume. The flood waters were not drawn into the Khari Cut Canal but were passed down to the Kalambandhi villages. Under this canal 14,067 acres were irrigated in the Kharif season and 447 acres in the Rabi season.

The area irrigated, the revenue assessed and the working expenses in connection with the Hathmati and Khari Cut Canals compare with the average of the three preceding years as under :—

Year.	Kharif.		Rabi.		Total.		Working expenses.
	Area irrigated.	Assessment.	Area irrigated.	Assessment.	Area irrigated.	Assessment.	
	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
Average ..	7,044	42,103	2,368	6,525	9,412	48,628	38,110
1937-38 ..	15,814	94,109	4,169	12,211	19,983	1,06,320	37,915

The remissions sanctioned during the year amounted to Rs. 3,124. The gross revenue realised from all sources amounted to Rs. 1,04,575, while the working expenses were Rs. 37,915. These figures show a gross return of 5·05 per cent. on the total capital outlay of Rs. 13,18,729.

First Class Irrigation Tanks in Gujarat.

The five first class tanks, viz. Wangroli, Savli, Saiat, Tranza Nagrama and Futelao were constructed between the years 1904 and 1917 at the aggregate cost of Rs. 11 lakhs. They rarely yield any net return, as the demand for water from them is small in years of good rainfall, whereas in years of scarcity the tanks themselves store deficient supplies. The first four tanks are situated in Kaira Collectorate, while the last one is in the Broach and Panch Mahals Collectorate.

The area irrigated, the revenue assessed and the working expenses in connection with the tanks during the year are compared with the average of the preceding three years as below :—

Name of Tank.	Year.	Kharif.		Rabi.		Total.		Working expenses.
		Area irrigated.	Assessment.	Area irrigated.	Assessment.	Area irrigated.	Assessment.	
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
Wangroli ..	Average ..	633	3,244	201	804	834	4,047	7,191
	1937-38 ..	1,379	6,742	527	2,108	1,906	8,850	6,405
Savli ..	Average ..	941	4,752	45	173	986	4,925	6,057
	1937-38 ..	1,820	9,067	..	..	1,820	9,067	5,214
Saiat ..	Average ..	223	1,055	183	740	403	1,796	3,639
	1937-38 ..	463	1,839	128	515	591	2,354	3,116
Tranza Nagrama ..	Average ..	50	198	5	18	55	216	2,268
	1937-38 ..	2	7	..	...	2	7	1,794
Futelao ..	Average ..	6	11	15	46	21	56	1,345
	1937-38 ..	57	114	51	153	108	267	5,955

Wangroli Tank.

The rainfall gauged at the site of the tank was 38·74 inches. The tank was partially filled and the water was utilised in irrigating the Kharif and Rabi crops (mainly rice, wheat and gram). The miscellaneous revenue realised during the year amounted to Rs. 1,019 compared with Rs. 479 received during the previous year.

Savli Tank.

The rainfall gauged at the site of the tank was 37·72 inches. The tank was partially filled and the water was utilised in irrigating Kharif crops

which were mainly rice. There was no Rabi irrigation. The miscellaneous revenue realised amounted to Rs. 1,122 compared with Rs. 452 received during the previous year.

Saiat Tank.

The rainfall gauged at the site of the tank was 31·07 inches. The tank was partially filled and the water was utilised in irrigating both Kharif and Rabi crops. these being rice, wheat and gram. The miscellaneous revenue realised amounted to Rs. 946 compared with Rs. 458 received in the previous year.

Tranza Nagrama Tanks.

The rainfall gauged at Nagrama was 33·30 inches and it was the same at Tranza. The tanks did not fill during the year and there was practically no irrigation in the Kharif and Rabi seasons. The miscellaneous revenue realised amounted to Rs. 1,317 compared with Rs. 941 received in the previous year.

Futelao Tank.

The rainfall gauged at the site of the tank was 25·64 inches during the year. The tank was partially filled and the water was utilised in irrigating Kharif and Rabi crops. The miscellaneous revenue realised amounted to Rs. 20 compared with Rs. 7 received in the previous year. The special repair works on this tank during the scarcity period were carried out at the cost of Rs. 3,981.

The percentage returns obtained during the year from the working of these tanks are shown below :—

Name of Tank.	Gross assessment.	Gross realisation.	Less working expenses.	Net revenue.	Capital outlay direct and indirect to end of 1937–38.	Percentage of return.
	Rs.	Rs.	Rs.	Rs.	Rs.	
Wangroli ..	9,869	5,116	6,405	—1,289	2,93,295	—0·44
Savli	10,189	4,763	5,214	—451	2,55,210	—0·18
Saiat	3,300	2,134	3,116	—982	1,84,029	—0·53
Tranza Nagrama ..	1,324	1,327	1,794	—467	2,80,635	—0·17
Futelao	287	30	5,955	—5,925	1,16,461	—5·09

DECCAN IRRIGATION CIRCLE.

The rainfall was inadequate and untimely in the Nira Left Bank Canal and Nira Right Bank Canal tracts. It was however satisfactory in the catchment as well as in the canal tracts of the Pravara, Godavari and Mutha Canals tracts.

The general condition of the irrigated crops was satisfactory. There was keen demand for sugarcane towards the end of the year due to rise in Gul rates.

The following factories have been established on the Deccan Canals and the acreages for which water is guaranteed at present is noted against each :—

Name of sugar factory	Annual guarantee of water supply for areas of sugarcane.	Capacity in tons per day.
	Acres.	
1. The Belapur Company, Harigaon, Pravara Left Bank Canal.	2,750	600
2. The Maharashtra Sugar Mills Limited near Belapur, Pravara Left Bank Canal.	2,350	500
3. Messrs. Marsland Price and Company Limited at Kalamb, Nira Left Bank Canal.	1,400	500
4. The Phaltan Sugar Works Limited near Tadavli, Nira Right Bank Canal.	2,500	500
5. The Saswad Mali Sugar Factory Limited near Akluj, Nira Right Bank Canal.	1,200	300
6. The Ravalgaon Sugar Farm Limited near Ravalgaon, Girna Canal.	1,400	200
7. Belwandi Sugar Farm near Visapur-Visapur Canal.	No guarantee in respect of area is given but $\frac{3}{4}$th of the water available in the Visapur tank is guaranteed annually.	200

The Brihan Maharashtra Sugar Syndicate Limited, Nira Right Bank Canal, has just started erection work of machinery of their Factory and water for 1,250 acres has been guaranteed to the Syndicate.

The areas of sugarcane planted by the sugar factories during the year were 11,435 acres.

A number of drainage projects to save lands from damage due to intensive cultivation of sugarcane by Sugar Companies have been prepared and construction work of some of these schemes has been commenced.

The total area irrigated in the Deccan Irrigation Circle during the year was 2,35,811 acres as compared with 2,71,388 acres during the previous year and the gross revenue amounted to Rs. 27·50 lakhs as compared with the figure of Rs. 30·20 lakhs for the previous year.

NIRA RIGHT BANK CANAL DIVISION.

LLOYD DAM AT BHATGAR AND NIRA RIGHT BANK CANAL.

The Nira Right Bank Canal is the largest canal in the Deccan. The original estimate of the project framed in 1910 provided for :—

(1) The raising of the Dam at Bhatgar by 60 feet in order to increase its storage capacity from 5,300 million cubic feet to 24,000 million cubic feet ;

(2) The construction of a canal 109 miles long on the right bank of the Nira river having a capacity of 1,500 cusecs at head ; and

(3) The enlarging of the existing Nira Left Bank Canal in order to increase its discharge from 450 to 760 cusecs.

The total cost was estimated at about Rs. 258 lakhs and the area to be irrigated annually at 190,000 acres. The project was submitted to the Government of India in May 1911, sanctioned by the Secretary of State in June 1912 and the work was started in the same year. Before the work of raising the Bhatgar Dam was commenced, however, it was decided for technical reason to build an entirely new dam. Owing to this change and to the unprecedented rise in the cost of labour and materials due to the Great War, a revised estimate amounting to Rs. 491 lakhs was framed in 1920 and submitted to the Government of India in September 1921. The revised project provided for :—

(1) The construction of a new dam at Bhatgar designed to increase the storage from 5,300 million cubic feet to 24,000 million cubic feet ;

(2) The construction of a canal 106½ miles long on the right bank of the Nira river ; and

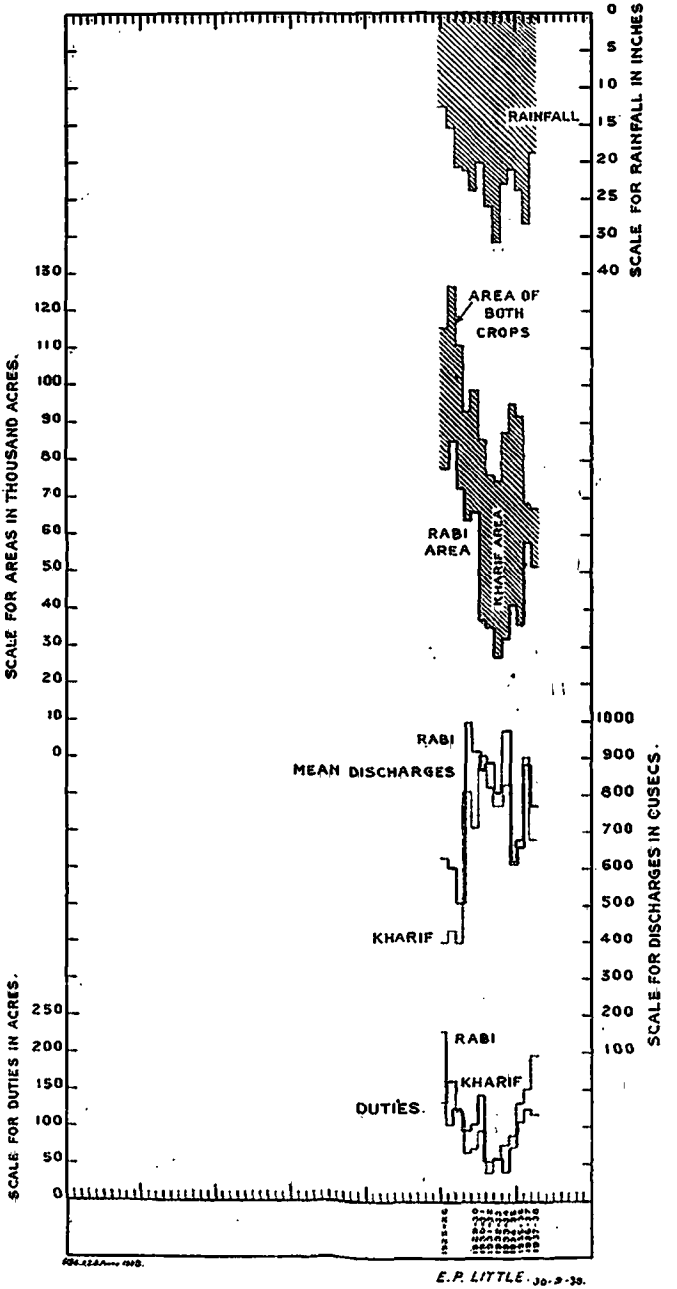
(3) The enlargement of the Nira Left Bank Canal, including the expenditure of Rs. 3¾ lakhs already incurred on widening the Nira left bank canal.

It was anticipated that 132,000 acres would be irrigated annually as a result of this scheme and that the gross revenue would amount to Rs. 15·22 lakhs and the net revenue to Rs. 11·92 lakhs yielding a return of 2·4 per cent. on the capital outlay. The revised project was sanctioned by the Secretary of State in June 1922.

The Lloyd Dam at Bhatgar, 190 feet high, 5,333 feet long including the waste weir (4,266 feet long excluding the waste weir) and 124 feet wide at the base, was completed in 1928 at a cost of Rs. 172 lakhs. It is one of the largest dams in the world and contains 21½ million cubic feet of masonry. The lake formed by the construction of the dam has a length of 17 miles at full supply level with a corresponding storage capacity of 24,000 million cubic feet. The catchment area is 128 square miles in extent with an annual rainfall varying from 250 inches in the Ghats to 40 inches at Bhatgar. In addition to the sluices required for releasing water for irrigation purposes there are 81 waste weir gates for the control and regulation of the flood level in the lake.

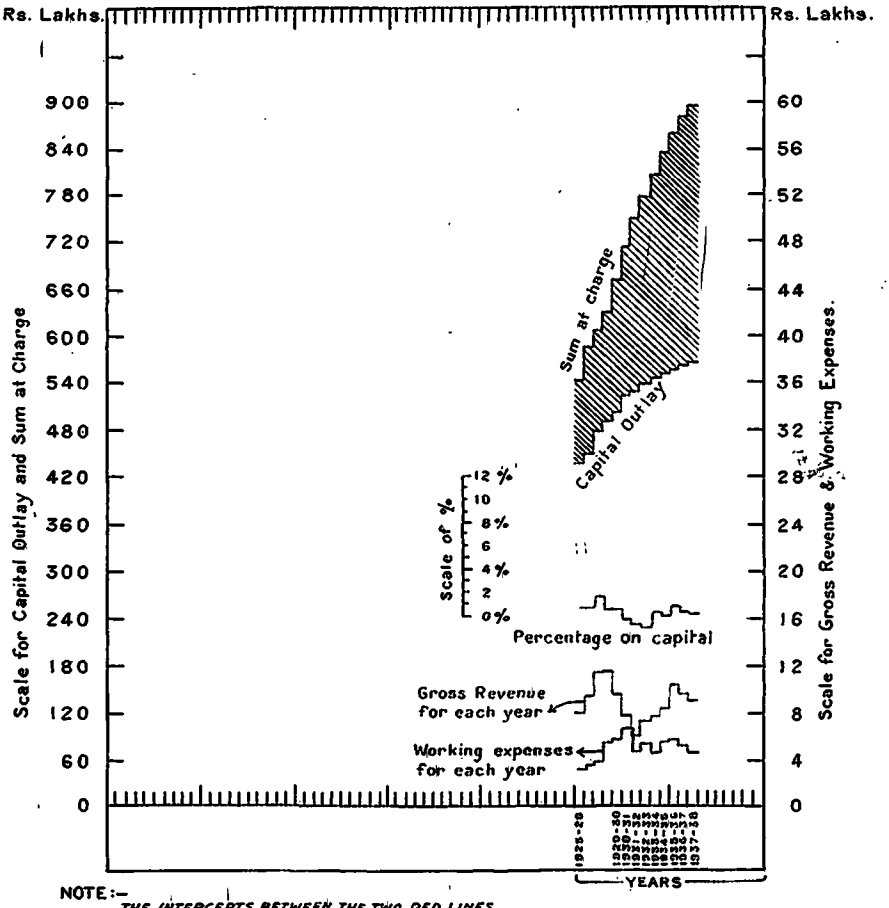
The Nira Right Bank Canal has its head works at Vir, 17 miles from the Lloyd Dam. The designed discharges of the canal at head and at tail are

WORKING RECORD
FOR
NIRA RIGHT & LEFT BANK CANALS
1925 – 1938.



E.P. LITTLE. 30-9-39.
EXECUTIVE ENGINEER,
NIRA R.B. CANAL DIVISION.

FINANCIAL RECORD
FOR
Nira Right & Left Bank Canals.
1925-1938



NOTE:- *THE INTERCEPTS BETWEEN THE TWO RED LINES SHOW ARREARS OF INTEREST UNPAID UP TO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL, GIVE SUM AT CHARGE. THE INTERCEPTS BETWEEN THE BLACK & RED LINES SHOW THE NET INCOME EACH YEAR.*

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EXECUTIVE ENGINEER
NIRA R.B. CANAL DIVISION

(O) G.P.Z.O. Poona, 1938

1,500 and 414 cusecs, respectively, the corresponding full supply depths being 8·5 and 6·5 feet, respectively. The canal about 106½ miles in length commands lands situated in the Satara and Sholapur Districts and the Phaltan State. Water was first supplied from the canal for the irrigation of rabi crops in 1924–25. The works on the main canal are completed. The Lloyd Dam was completed in the year 1928 and the Nira Right Bank Canal Project was completed in the year 1937–38. There are 3 branches and 69 distributaries taking off from the canal, while the culturable area commanded by it is 448,000 acres. The water regulation and distribution works on the canal are constructed on modern lines and the latest types of Standing Wave Flume measuring devices are provided at distributary heads on the channels. The whole of the perennial area under the canal has been surveyed and the soil classification carried out before designing the channels, while the lands suitable for perennial and other crops have been classified by the Irrigation Research Division and shown on maps.

On the 1st April, the level of the water in Lake Whiting at Bhatgar was 101·10 feet (full supply level 143 feet) above the sill of the sluices, the corresponding contents being 9967·41 million cubic feet. The lowest level of 77·10 feet was reached on the 20th June, the corresponding contents being 4158·17 million cubic feet. The lake began to fill subsequently and received replenishment up to its full supply level of 143 feet on the 1st September. Full supply level was maintained till the 16th October, when the draw-off for irrigation purposes commenced. On the 31st March 1938, the water level was at 107·90 feet, the corresponding contents being 11932·69 million cubic feet. The rainfall gauged at Bhatgar during the year was 49·84 inches, while the rainfall in the canal tract averaged 17·02 inches.

The following table gives the area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
41,543	35,866	4,06,238	3,20,928	4,28,155	3,39,602

Working expenses.		Realisations.		Rainfall.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
3,00,707	3,35,919	4,09,661	2,91,151	17·02	21·10

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The increase in the area irrigated and revenue assessed were due to increased demand of water on account of inadequate rainfall. The area under sugarcane was 7,883 acres as compared with 8,400 acres in the previous year. The areas of sugarcane blocks and two-season blocks were 2,730 acres and 10,451 acres as compared with 2,402 acres and 8,848 acres, respectively, in the previous year. The area of garden and fruit blocks totalled 94 acres as compared with 106 acres of the previous year. The remissions sanctioned during the year amounted to Rs. 190.

The cost of the measuring establishment employed was pies 8 per acre as against pies 3 of the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 1,16,538. The perennial section of the Nira Right Bank Canal extended up to mile 79.

POONA IRRIGATION DIVISION.

Nira Left Bank Canal.

This canal forms part of the scheme known as the Nira Valley Development Project and irrigates lands situated on the left bank of the Nira river. It is one of the pioneer irrigation works in the Deccan and protects a tract in the Poona District, with a very precarious rainfall. The original scheme consisted of—

(*a*) A ghat-fed storage tank at Bhatgar (Lake Whiting) about 32 miles south of Poona on the Yelwandi river, impounding 5,300 million cubic feet of water ;

(*b*) A pick-up-weir at Vir on the Nira river about 17 miles down stream from Bhatgar ;

(*c*) A canal about 100 miles long irrigating about 80,000 acres annually ; and

(*d*) The Shetphal Tank at the tail of the canal with an effective capacity of 592 million cubic feet for the purpose of storing a portion of the surplus monsoon discharge.

The original masonry dam at Bhatgar, 127 feet high, has since been replaced by the higher Lloyd Dam mentioned above. The original works were commenced in 1881 and the canal came into operation in 1885–86. The canal originally had a capacity of 456 cusecs but it has now been remodelled to carry a discharge of 720 cusecs. The canal, together with the tank, commands a gross area of 201,000 acres while the area commanded by the Shetphal Tank itself is 23,500 acres. The culturable area under the canal is 149,821 acres.

Nira Valley Development Project.

This project was designed for the complete development of irrigation in the Nira Valley. It provided, *inter alia*, for the widening and remodelling of the Nira Left Bank Canal in order that the canal should irrigate an additional area of 19,000 acres of various types of crops and the construction of a new dam at Vir designed to supplement the storage of 24,000 million cubic feet impounded by the Lloyd Dam at Bhatgar. The construction of the Vir Dam, estimated to cost about a crore of rupees which was abandoned on the assumption that by economical distribution of the water available, the storage at Bhatgar would be sufficient to meet

all irrigation requirements of the Nira Valley, will however have to be reconsidered owing to the development of irrigation by the opening of sugar factories in the Valley. The remodelling of the Nira Left Bank Canal, which was started in the year 1925–26, has made considerable progress and the work is expected to be completed by the end of the year 1941–42. The expenditure incurred during the year amounted to Rs. 42,868.

The rainfall at Bhatgar was 49·84 inches as compared with 43·91 inches, the average rainfall during the past 36 years. The rainfall along the Nira Left Bank Canal was 19·88 inches. The water in the Shetphal Tank reached its lowest depth of 19·20 feet on the 12th June, the corresponding contents being 127 million cubic feet. The tank reached the full supply level of 37·50 feet on the 29th September 1937, the corresponding contents being 572·53 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the previous three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
77,759	64,741	7,28,160	6,71,666	7,44,085	6,79,932

Working expenses.		Realisations.		Rainfall.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
2,07,279	2,11,962	5,14,372	6,73,827	19·88	18·48

The area of sugarcane blocks was 14,729 acres on the Nira Left Bank Canal and that on the Shetphal Tank 1,570 acres compared with 17,214 and 1,774 acres, respectively, during the previous year, while the area under two-season blocks on the Nira Left Bank Canal was 21,457 acres and on the Shetphal Tank 1,401 acres compared with 19,996 and 1,285 acres, respectively. The cost incurred on the measuring establishment employed was 5 pies per acre—the same figure as for the previous year. Remissions amounting to Rs. 1,417 and refunds up to the extent of Rs. 5

were sanctioned during the year under report. The cost of maintenance and repairs amounted to Rs. 81,081.

The perennial section of the Nira Left Bank Canal is up to mile 75 and that of the Shetphal Tank is up to mile 10 of the Shetphal Channel.

Mutha Canals.

This system came into operation in 1874–75. The canals were constructed at a cost of about Rs. 65½ lakhs, including the cost of a large ghat-fed storage reservoir (Lake Fife) on the Mutha river at Khadakwasla, about 12 miles from Poona. The dam is 107 feet high, spanning the valley of the Mutha. The system comprises two canals, the Mutha Right Bank and Mutha Left Bank Canals, 70 and 18 miles long, respectively. The maximum designed discharges of the two canals at their heads are 412 and 38·5 cusecs, respectively. Both the canals take off direct from the lake, which has a storage capacity of 3,955 million cubic feet, of which 508 million cubic feet are reserved for the Poona Water Supply system as a margin of safety in the event of replenishment being received late. The storage is partly utilised for drinking and domestic purposes in Poona and partly for irrigation. The supply available for irrigation being insufficient the perennial limit of the Mutha Right Bank Canal is restricted to the reach between the head of the canal and mile No. 23⅝, i.e. up to and including Distributary No. 9. Even so the supply available in the lake is totally inadequate to meet the increasing demands on it and a project for increasing the storage is under consideration. The Matoba tank is a tail tank receiving the surplus supply of the canal during the monsoon months.

On 1st April, the level of water in Lake Fife was 17·05 feet above the sill of the canal sluices, the corresponding contents being 1,356 million cubic feet, as compared with 17·15 feet and 1366·45 million cubic feet in the previous year. The lowest level reached was 8·90 feet above sill level on the 19th of June when replenishment commenced. The lake overflowed on the 25th June. The water in the lake remained at the full supply level of 34 feet (contents 3,643 million cubic feet) up to the 26th September 1937 and the draw off commenced from 24th October 1937. The run-off from the catchment of the lake (196 square miles) amounted to 29605·06 million cubic feet. The level of water on the 31st March 1938 was 21·05 feet, the corresponding contents being 1,787 million cubic feet as compared with 17·15 feet and 1366·45 million cubic feet, respectively, in the previous year. The rainfall at Khadakwasla was 40·16 inches as compared with 21·77 inches in the previous year. The tank dried up on the 13th March 1937. Replenishment from the Mutha Right Bank Canal commenced from the 23rd June. The full supply level of the tank 29 (feet) was reached on the 27th July, the corresponding contents being 220·54 million cubic feet. The level of water of Lake Fife on the 31st March 1938 was 21·05 feet, the correesponding contents being 1,787 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the previous three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
17,491	13,262	1,41,624	1,76,319	3,28,838	3,86,975

Working expenses.		Realisations.		Rainfall.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
1,02,916	98,632	3,25,643	4,26,507	23·33	17·64

The area cultivated under sugarcane (including overlap) was 2,364 acres as compared with 3,844 acres in the previous year. The area under two-season blocks on the Mutha Canals was 2,070 acres and that on Matoba Tank 1,833 acres as compared with 1,648 and 1,634 acres, respectively, in the previous year. The quantities of water supplied to the Poona Cantonment and Poona City Municipality during the year was 1,169 and 2,456 million gallons, respectively, as comapared with 1,258 and 3,109 million gallons, respectively, in the previous year. The revenue assessed amounted to Rs. 46,794 and Rs. 1,12,454, respectively, compared with Rs. 51,008 and Rs. 1,52,026, respectively, during the previous year. The cost incurred on the measuring establishment employed was equivalent to a figure of 11 pies per acre against Re. 0–1–1 in the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 40,493.

Kasurdi Tank.

This tank which dried up on 19th October 1936 received its first replenishment on the 18th June 1937 up to a level of 16·50 feet and dried on 27th June 1937. Further replenishment was received on the 29th September up to its F. S. L. of 17·50 feet and dried up on the 27th October. Rain on 31st October filled the tank to a level of 16·50 feet and it finally dried on 8th November. The tank is almost completely silted up and hence the irrigated area is small. The leasing out of the tank bed for cultivation is the main source of revenue and fetched Rs. 1,033 during the year under report.

Shirsuphal Tank.

On the 15th February 1937, the level of water in the tank was 11·10 feet, the corresponding contents being 19·77 million cubic feet. The tank dried up on the 27th February. Replenishment was received on the 12th June and the tank dried up on 9th July. The highest level reached was 25·05 feet on the 23rd September, the corresponding contents being 182 million cubic feet. The tank did not fill to its full supply level. The supply available was fully utilised for irrigation.

Bhadalwadi Tank.

On the 15th February 1937, the level of water in the tank was 29·10 feet, the corresponding contents being 113·48 million cubic feet. The lowest level of 24·70 feet was recorded on the 11th June, the corresponding contents being 67·62 million cubic feet. The full supply level of 35·70 feet was reached on the 27th September, the corresponding contents being 190·73 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

Name of tank.	Area irrigated.		Water rates.		Gross assessed revenue.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Kasurdi	22	30	64	113	1,352	826
Shirsuphal ..	807	1,013	3,662	5,561	4,227	5,915
Bhadalwadi	1,470	894	7,455	4,651	7,837	4,703

Name of tank.	Working expenses.		Realisations.		Rainfall.	
	1937–38.	Average	1937–38.	Average.	1937–38	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Kasurdi	1,027	3,054	1,337	906	14·50	12·71
Shirsuphal	2,974	2,918	3,493	6,760	17·13	15·29
Bhadalwadi	3,489	3,244	4,884	5,617	23·50	22·64

NASIK IRRIGATION DIVISION.

GODAVARI CANALS.

This is one of the major irrigation works undertaken in the Deccan for the protection of areas liable to famine. It was started in 1907 and completed in 1915–16 at a cost of about 1 crore of rupees. The system comprises :—

(1) A storage reservoir (Lake Beale) on the Darna River, a tributary of the Godavari situated about 20 miles from Nasik ;

(2) A pick-up-weir at Nandur-Madhmeshwar on the Godavari, 47 miles below the Darna Dam, which impounds the water released from the storage reservoir ; and

(3) Two canals, the Right Bank Canal, 69 miles long, which serves the northern tracts of the Ahmednagar District and the Left Bank Canal, 48 miles long, which irrigates lands north of the Godavari in the Nasik and Ahmednagar Districts.

The length of the Darna Dam (inclusive of its waste weir) exceeds a mile and the dam has a maximum height of 92 feet above its lowest foundation level. The lake has a storage capacity of 7,763 million cubic feet and the cost of the dam was Rs. 34·27 lakhs. The catchment area is 156 square miles. The weir at Nandur-Madhmeshwar is a work of considerable magnitude, its length being 3,618 feet inclusive of the Right and Left Bank Canal regulators. It has a maximum height of 34 feet above the level of the river bed. Scouring sluices have been constructed close to the head regulators of the two canals with the object of keeping the approach channels to the latter clear of silt. The total area under the command of the canals is 232,390 acres. The two canals (Right Bank and Left Bank) are designed to discharge 384 and 228 cusecs at their heads, respectively, with full supply depths of 7 feet and 6 feet, respectively.

On the 1st April, the level of water in the lake was 51·90 feet, the corresponding contents being 4,056 million cubic feet. The lowest level of 28·90 feet was reached on the 22nd June, the contents being 1,104 million cubic feet, when the lake began to receive replenishment, until it over-flowed on the 11th July. The draw-off for irrigation purposes commenced on the 1st December with a water level of 64 feet, the corresponding contents being 7,418 million cubic feet. On the 31st March 1938, the level of water was 52·40 feet, the corresponding contents being 4,169 million cubic feet. The perennial limit of the Right Bank Canal is up to mile 60 and that of the Left Bank Canal up to 42 miles. The average rainfall in the catchment area of the lake was 95·74 inches.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

Name of work.	Area irrigated.		Water rates assessed.		Gross assessed revenue.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Lake Beale	425	530	1,414	1,843	4,88,888	3,39,614
Godavari Right Bank Canal	21,546	15,840	2,66,746	1,75,471		
Godavari Left Bank Canal.	14,552	11,688	1,91,408	1,37,127		

Name of work.	Working expenses.		Realisations.		Rainfall.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Lake Beale	2,57,078	3,33,790	5,29,843	3,38,152	..	..
Godavari Right Bank Canal					21·51	19·90
Godavari Left Bank Canal.					21·00	17·90

The increases in the area irrigated and the assessed revenue were due to increase in the sugarcane area. The area of sugarcane blocks was 15,836 acres as compared with 15,330 acres in the previous year. The area of two seasonal blocks was 2,842 acres against 3,359 in the previous year. The cost of the measuring establishment employed was 14 pies per acre against 7 pies as was obtained last year. The remissions sanctioned during the year amounted to Rs. 1,621. The cost incurred on maintenance and repairs amounted to Rs. 1,02,299.

Chankapur Tank—Girna Canal.

This is a comparatively small irrigation system situated in the Nasik District having its storage reservoir at Chankapur, fed from a catchment of 100 square miles in extent, and its pick-up-weir at Tengoda, situated further downstream on the Girna river, from which weir the Girna canal (19 miles in length) takes off. The tank is situated on the Girna river, a tributary of the Tapti, and has been formed by the construction of a masonry dam 140 feet high, which impounds 1,500 million cubic feet of water. The dam and the canal (up to mile 13) were completed in 1909–10 and the canal has been in operation since then. The extension of this canal, designed to carry about 40 cusecs, up to mile 19 was completed in 1920–21. The designed discharge of the canal at its head is 90 cusecs and at its tail 15 cusecs, the corresponding full supply depth being 4½ feet and

2 feet, respectively. The total area under the command of the canal is 29,182 acres and the irrigable area is 8,500 acres.

On the 1st April, the level of water in the tank was 76·10 feet, the corresponding contents being 798 million cubic feet. The lowest level of 48·60 feet was reached on the 14th June (contents 260 million cubic feet) when the lake began to receive replenishment, until it overflowed on the 18th July (the full supply depth being 92 feet), the corresponding contents being 1,535 million cubic feet. The first draw off for irrigation purposes commenced on the 13th November with the level of water at 91·70 feet, the corresponding contents being 1,529 million cubic feet. On the 31st March 1938, the level of water was 78·20 feet, the contents then being 871 million cubic feet. The run-off from the catchment of the tank (100 square miles) was 9,997 million cubic feet with an average rainfall of 69·70 inches.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
10,348	9,674	90,139	1,01,039	92,955	1,02,623

Working expenses.		Realisations.		Rainfall.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
46,873	54,457	76,133	90,326	22·70	18·39

The decrease in the assessed revenue was due to the sugarcane of the Company being charged at Rs. 28 per acre as the applications are now submitted in the Company's name. The cane area was 1,467 acres as compared with 1,694 acres in the previous year. The cost of measuring establishment was equivalent to 11 pies per acre as compared with 1 anna 2 pies obtained during the previous year. The remissions sanctioned during the year amounted to Rs. 69. The expenditure incurred on maintenance and repairs amounted to Rs. 18,204.

Kadwa River Works.

These works, which came into operation in 1868–69, consist of three small canals, viz., the Palkhed, the Ojhar Tambat and the Wadali, taking off from weirs constructed across the Kadwa river and its tributary the

Banganga. The system comprises 38 miles of canals and distributaries. The storage reservoir is at Waghad (a ghat-fed storage) situated on the Kolwan river in the Nasik District. The catchment of the tank is 29 square miles in extent. The tank is remarkable for the size of its earthen dam, which has a maximum height of 96 feet. The designed discharges of the Palkhed canal at its head and at its tail are 90 cusecs and 15 cusecs, respectively, the corresponding depths at full supply being 4½ feet and 2 feet. The designed discharges of the Ojhar Tambat canal at its head and at its tail are 33 cusecs and 5 cusecs, respectively, the depths at full supply being 3 feet and 1 foot, respectively. The designed discharges of the Wadali canal at its head and at its tail are 19 cusecs and 5 cusecs, respectively, the depths at full supply being 2 feet and 1 foot, respectively.

On the 1st April, the level of water in the tank was 40·05 feet above the sill, the corresponding contents being 299 million cubic feet. On the 22nd June, the level of water fell to 26·15 feet, when the lake began to receive replenishment until it overflowed on the 12th July 1937. The draw-off for irrigation purposes commenced on the 3rd December with a water level of 47·45 feet, the corresponding contents being 503 million cubic feet. On the 31st March 1938 the level of water was 38·30 feet, the corresponding contents being 261 million cubic feet.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

Name of Canal.	Area irrigated.		Water rates assessed.		Gross revenue assessed.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Palkhed Canal ..	2,647	2,131	21,519	17,722	42,239	39,970
Ojhar Tambat Canal ..	1,162	1,074	10,155	10,337		
Wadali Canal ..	946	874	8,871	9,096		

Name of Canal.	Working expenses.		Realisations.		Rainfall.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Palkhed Canal ..	29,960	28,759	45,500	20,760	23·65	21·96
Ojhar Tambat Canal ..					20·56	21·16
Wadali Canal ..					19·03	20·03

Controlling devices have been fixed on the outlets of the canals for the proper control over the distribution of water and efforts were made to regularise the management of irrigation on this system, which made it possible to allow water to a larger area. The expenditure on maintenance and repairs amounted to Rs. 11,654.

The cost incurred on the measuring establishment employed was 1 anna per acre as against 6 pies for the previous year. Remissions sanctioned during the year amounted to Rs. 4 only.

AHMEDNAGAR DIVISION.

PRAVARA RIVER WORKS.

This canal system, which was constructed at a cost of Rs. 1½ crores, comprises :—

(1) The Wilson Dam at Bhandardara on the Pravara river. This dam which impounds the water of the Lake Arthur Hill, is one of the highest dams in the world having a height of 282 feet. It is 1,600 feet in length and the lake formed by the dam has a storage capacity of some 12,092 million cubic feet.

(2) A pick-up-weir, 890 feet long, situated at Ojhar, 53 miles downstream from Lake Arthur Hill, and about 8 miles east of Sangamner ; and

(3) Two canals, the Pravara Right Bank Canal, 33 miles long, and the Pravara Left Bank Canal, 48 miles long, which take off at their weir at Ojhar.

These canals irrigate lands in the Ahmednagar District and command an area of 228,720 acres. The designed discharges of the two canals (Pravara Right and Left Bank Canals) at head are 152 and 530 cusecs, respectively, the corresponding full supply depths being 5 feet and 8 feet. The work of remodelling the first 16½ miles of the Pravara Left Bank Canal and the Northern Branch has almost been completed in order to meet the increased demand for water from the sugar factories established on the Left Bank Canal and the work of remodelling Distributary Nos. 8 and 9 and Water Course Nos. 32, 33 and 34 of the Pravara Left Bank Canal was started. With the remodelling of the canal and the rotational running now practised weeds do not appear at present. The Ojhar weir has been raised by two feet for additional storage. The height of the waste weir at Bhandardara was raised by 2·5 feet by constructing a crest wall. The construction of the Wilson Dam, which impounds the water of Lake Arthur Hill, was commenced in 1911 and completed in 1926. The catchment area of the lake is 47 square miles ; it is situated in the ghats and has an assured run-off. The dam is designed to impound a maximum depth of water of 270 feet and is constructed across a gorge in the valley of the Pravara river. At present water is impounded to a depth of 262·5 feet giving a storage of 10,557 million cubic feet and this could be increased to

12,092 million cubic feet with a corresponding depth of 270 feet by the erection of automatic gates on the waste weir or by the construction of siphon spillways and the raising of the waste weir.

On the 1st April, the level of water in the lake was 217·50 feet, the corresponding contents being 4,532 million cubic feet. The lowest level of 168·6 feet was reached on the 20th June, the contents being 1,567 million cubic feet. Replenishment commenced with effect from the 21st June and the full supply level of 262·5 feet was reached on the 23rd July, the contents being 10,908 million cubic feet. The maximum flood occurred on the 24th July, when the level was 266 feet, which lasted for about 12 hours. The full supply level was maintained till the 16th October 1937 and the draw off for irrigation purposes commenced on this date. The level of water gradually fell to 241·85 feet on the 15th February, the contents being 7,254 million cubic feet. The level of water on the 31st March 1938 was 229·15 feet, the corresponding contents being 5,697 million cubic feet. The yield from the catchment (47 square miles) of the lake was 24,317·29 million cubic feet while the average rainfall of the several raingauge stations was 152·57 inches. The rainfall was satisfactory as a result of which there was no heavy demand for water for seasonal irrigation.

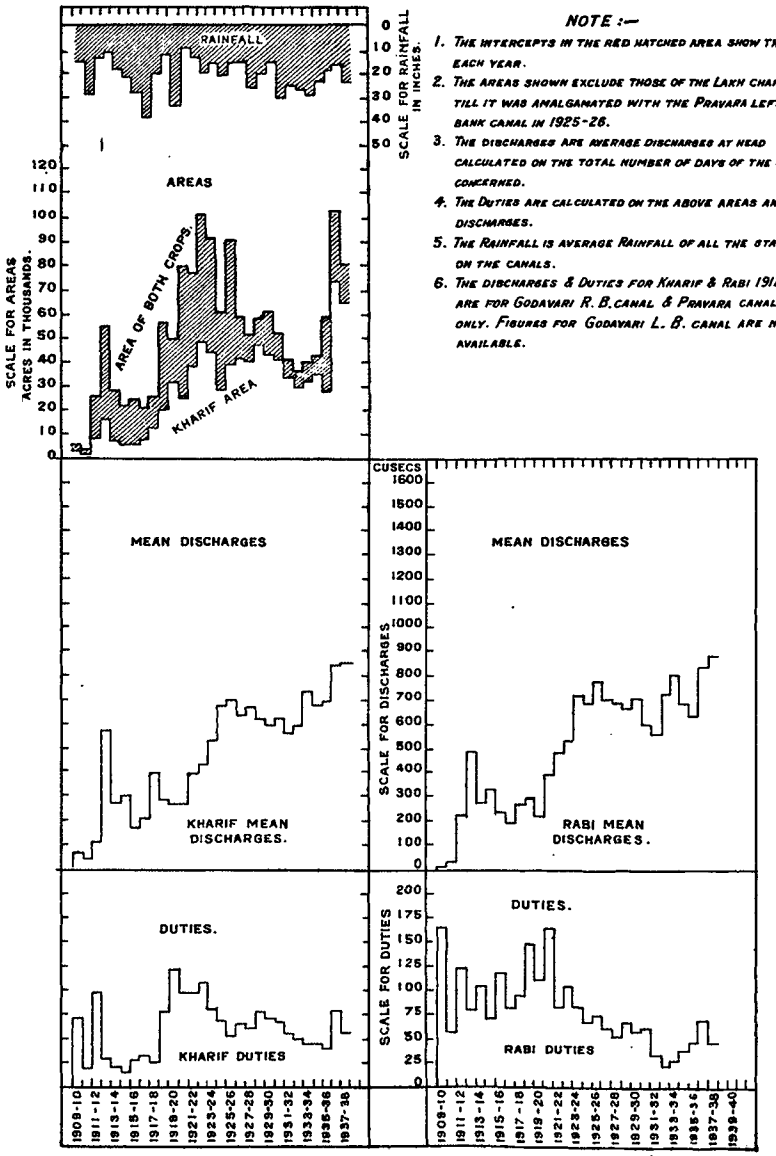
The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

Name of work.	Area irrigated.		Water rates assessed.		Gross assessed revenue.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Pravara Right Bank Canal .	9,710	8,326	1,17,218	1,05,887	1,22,673	5,48,150
Pravara Left Bank Canal ..	34,799	27,266	4,77,496	4,32,760	4,85,355	

Name of work.	Working expenses.		Realisations.		Rainfall.	
	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
	Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
Pravara Right Bank Canal .	4,35,480	2,96,498	7,75,679	5,52,568	24·29	21·09
Pravara Left Bank Canal ..					27·43	19·74

The increases in the area irrigated and the irrigation assessment were due to more irrigation of sugarcane by the sugar companies. The total

AHMEDNAGAR DIVISION
GODAVARI & PRAVARA CANALS
COMBINED WORKING RECORD.
FOR THE YEARS 1910-38



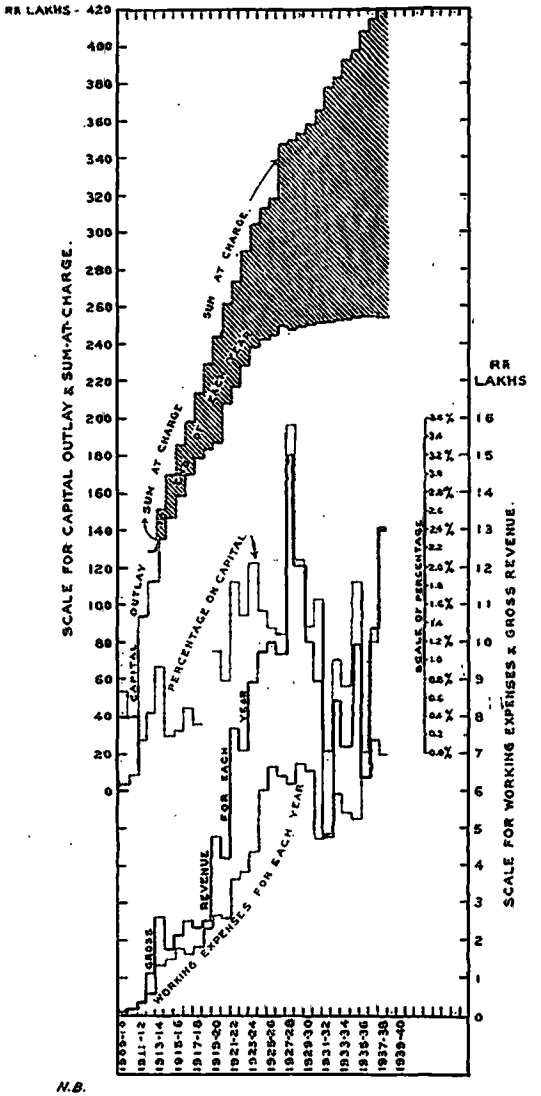
NOTE :—

1. The intercepts in the red hatched area show the Rabi areas each year.
2. The areas shown exclude those of the Lakh channel till it was amalgamated with the Pravara left bank canal in 1925-26.
3. The discharges are average discharges at head calculated on the total number of days of the season concerned.
4. The Duties are calculated on the above areas and discharges.
5. The Rainfall is average Rainfall of all the stations on the canals.
6. The discharges & Duties for Kharif & Rabi 1912-13 are for Godavari R. B. canal & Pravara canals only. Figures for Godavari L. B. canal are not available.

(R) S.R.D. Press, 1938

J.R. PHILLIPS.
29-9-38.
Executive Engineer,
Ahmednagar Division.

AHMEDNAGAR DIVISION
GODAVARI & PRAVARA CANALS
COMBINED FINANCIAL RECORD.
FOR THE YEARS 1910 – 38



N.B.

THE INTERCEPTS BETWEEN THE TWO RED LINES SHOW ARREARS OF INTEREST UNPAID UPTO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL, GIVE SUM AT CHARGE.
THE INTERCEPTS BETWEEN THE GREEN & BLACK LINES SHOW THE NET INCOME EACH YEAR.

NAME OF CANAL	CONSTRUCTION COMMENCED IN.	CANAL WAS OPENED IN.
GODAVARI CANALS.	1907	1911 – 12
PRAVARA CANALS.	1909	1909-10

J.R.PHILLIPS.
23-3-38.
EXECUTIVE ENGINEER.
AHMEDNAGAR DIVISION

C.E.S.A. Poona, 1938.

area of sugarcane blocks was 8,926 acres while the area under two-seasonal blocks was 486 acres as compared with 9,535 acres and 727 acres, respectively, in the previous year. The remissions sanctioned during the year amounted to Rs. 2,145. The cost of the measuring establishment was equivalent to 11 pies per acre as compared with the figure of 5 pies of the previous year. The expenditure incurred on maintenance and repairs to the Wilson Dam and the two canals amounted to Rs. 81,490.

Bhatodi Tank.

This is a small tank situated on the Mehekri river about 12 miles from Ahmednagar. It depends entirely on local rains for its supply. Due to silting, the storage capacity of the tank has been reduced from 154 million cubic feet to about 40 million cubic feet. The tank was dry from 1st to 18th April 1937 and the first replenishment was received on 19th April, which raised the level of water to 24 feet. The highest level of 26·50 feet was reached on 4th October and the waste weir overflowed to a depth of 4 feet. The lowest level in the tank was 20·10 feet on the 12th June.

The following table gives the figures of area irrigated, revenue assessed, etc., during the year as compared with the averages of the past three years :—

Area irrigated.		Water rates assessed.		Gross assessed revenue.	
1937-38.	Average.	1937-38.	Average.	1937-38	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
584	653	2,699	3,464	3,912	4,632

Working expenses.		Realisations.		Rainfall.	
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Rs.	Rs.	Rs.	Rs.	Inches.	Inches.
2,832	2,560	5,251	6,263	20·18	20·89

The decreases in the area irrigated and the assessment were due to less demand for irrigation on account of timely rainfall. The area of two seasonal blocks was 424 acres. The remissions sanctioned during the year amounted to Rs. 878. The expenditure incurred on maintenance and repairs during the year amounted to Rs. 980.

CENTRAL CIRCLE.

SATARA DIVISION.

The area irrigated, the gross assessed revenue and the working expenses of the 6 works mentioned below as compared with the averages of the preceding three years, are given in the following statement :—

Name of work.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1937-38	Average.	1937-38	Average.	1937-38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1. Krishna Canal ..	4,339	3,976	40,056	61,731	42,540	20,972
2. Rewari Canal ..	606	478	3,537	3,206	2,168	3,088
3. Upper Man River Works.	1,076	728	5,817	4,334	4,650	9,101
4. Yerla River Irrigation Works.	3,359	2,691	19,204	17,052	10,692	11,324
5. Chikhli Canal ..	279	333	1,585	2,967	1,266	1,424
6. Maini Tank ..	1,509	1,241	6,920	6,715	4,033	4,580

KRISHNA CANAL.

The total rainfall gauged at Retre Budruk, which is situated in the centre of the canal tract, was 28·94 inches, as compared with the average of 25·52 inches for the past three years. Water could not be made available for sugarcane beyond mile 16/4 of the canal, as its discharging capacity has been considerably reduced owing to the accumulation of silt. The work of silt clearance is in progress now.

REWARI CANAL.

The rainfall gauged at Rewari, which is situated one mile below the bandhara, was 26·21 inches, as compared with 24·52 inches, the average of the preceding three years. There was more demand for canal water, as the rainfall was insufficient during the rabi season.

UPPER MAN RIVER WORKS.

(*Pingli Tank.*)

On the 1st April, the level of the tank was at R. L. 2363·45 equivalent to a storage of 61·05 million cubic feet. The tank was dry from the 25th August to the 21st September 1937. The first replenishment was received on the 22nd September when the water level rose to R. L. 2359·19 which was equivalent to a storage of 26·43 million cubic feet.

Further substantial replenishments were received during the monsoon with the result that the waste weir overflowed from 5th to 15th October and again from 26th to 31st October. The H. F. L. was reached on the 26th October, when the R. L. stood at 2371·24. The draw off began from the 7th November. The rainfall gauged at Gondawle, which is situated 3 miles below the tank, was 18·13 inches compared with 21·18 inches, the average of the preceding three years.

Yerla River Irrigation Works.

(*Nehr Tank.*)

On the 1st April, the R. L. in the tank was 2654·61 equivalent to a storage of 144·50 million cubic feet. The supply was utilised for hot weather irrigation. The first replenishment was received on the 20th April which raised the water level from R. L. 2653·42 to R. L. 2653·52. Another replenishment was received on the 23rd April which raised the level to R. L. 2654·98, *i.e.*, equivalent to 151·23 million cubic feet. The highest level was reached during the year on the 5th October when the R. L. was 2666·52 and water began to flow over the waste weir. The rainfall gauged at Nehr was 31·98 inches as compared with 25·03 inches, the average of the preceding three years.

Chikhli Canal.

On the 1st April, the level of the water in the river was 2 feet. The first flood, which occurred on the 18th April raised the level by 4·5 feet. Another flood of equal volume occurred on the 11th June when it overflowed the weir. The rainfall gauged at Chikhli was 20·20 inches compared with 18·10 inches, the average of the preceding three years.

Maini Tank.

On the 1st April, the tank was dry and it remained so until the first replenishment was received on the 19th April when the R. L. rose to 2298·52 equivalent to a storage of 6·47 million cubic feet. Subsequent replenishments were received on 29th May, 10th and 11th June raising the level to R. L. 2304·22 or equivalent to 70·25 million cubic feet and the waste weir then began to overflow. The highest level reached during the year was on the 30th October, when the R. L. stood at 2304·92. The draw off began on 9th November. The rainfall gauged at Maini was 17·68 inches as compared with 21·21 inches, the average of the preceding three years.

SHOLAPUR DIVISION.

The area irrigated, the gross assessed revenue and the working expenses of the tanks in the Sholapur Division, as compared with the corresponding

averages of the preceding three years, are given in the following statement :—

Name of work.	Area irrigated.		Gross assessed revenue.		Working expenses.	
	1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
Ekruk Tank	4,217	3,335	1,49,860	1,39,031	18,101	22,632
Koregaon Tank ..	354	334	2,021	1,729	1,963	1,892
Ashti Tank	3,751	2,608	25,555	15,551	10,185	37,833
Pathri Tank	779	532	11,918	11,390	3,863	3,532

Ekruk Tank.

The Ekruk Tank, situated near Sholapur, which came into operation in the year 1872-73, is an artificial reservoir formed by the construction of a large earthen embankment 7,000 feet long and having a maximum height of 76 feet. It supplies water not only for irrigational purposes but also to the town of Sholapur, the mills in Sholapur and the Great Indian Peninsula Railway for non-irrigational purposes. Under unfavourable conditions of replenishment, which occur periodically, the supply available from the tank is not sufficient to meet all the demands which arise, and the question of providing a supplementary storage is under consideration.

On the April 1st, the level of the water in the tank was 33·97 feet above the sill of the outlet. The storage available on the 31st May was found sufficient to admit of cultivation of 1,200 acres of monsoon crops in addition to 300 acres of cane. The tank received replenishment twice during the year once in July and again in September-October 1937. Water applications for 2,200 acres were sanctioned for an additional Rabi area. The highest level of water reached was 1518·50 on 7th October. The mean rainfall gauged at the five stations in the catchment area of the tank was 20·35 inches as compared with 21·43 inches, the average of the preceding three years, and the total replenishment received amounted to 996·01 million cubic feet.

Koregaon Tank.

On the 1st April, the level of the water in the tank was below the sill of the outlet. Hence water was not available for kharif crops. The tank received replenishment in September and October and all the available water was utilised for rabi crops. The highest level reached during the year which occurred on the 16th October was R. L. 89·60. The rainfall recorded was 20·02 inches as compared with 24·79 inches, the average of the preceding three years.

Ashti Tank.

On the 1st April, the level of the water in the tank was at R. L. 220·36, *i.e.*, 10·59 feet above the sill of the outlet. The highest level was reached during the year on the 1st May when the level was at 222·44. With the rains of September and October there was sufficient water in the tank to meet the requirements of the rabi season as well as kharif season. The mean rainfall gauged at the two stations situated in the catchment was 12·00 inches as compared with the average of 22·78 inches for the preceding three years.

Pathri Tank.

The tank supplies water to the town of Barsi and the mill industries, as well as for irrigational purposes. On the 1st April, the level of the water in the tank was at R. L. 234, i.e., 24·10 feet above the sill of the outlet. This gradually fell to 23·70 feet in June. The tank received replenishment in the months of June, July and August. The highest level reached during the year was 240·15 on the 7th October. The supply was thus sufficient to meet the requirements of irrigation and the Municipality. The mean rainfall gauged at the two stations, situated in the catchment area was 26·46 inches as compared with 29·01 inches, the average of the preceding three years.

Mhaswad Tank.

This irrigation tank is formed by an earthen dam built across the Man river, the dam being 9,000 feet long and 80 feet high at its highest point. The tank, which is situated on the eastern border of the Satara District, has a storage capacity of 2,602 million cubic feet and supplies water for the irrigation of lands situated in the Sholapur District. Owing to the precarious nature of the rainfall received in the catchment area the supply is not reliable. The tank is provided with a masonry overflow waste weir. The project was commenced in 1876–77 and completed in 1888–89. There is only one canal taking off from the left flank of the dam, previously called Mhaswad Canal No. 1 and now termed Mhaswad Canal, Part I. The designed discharge of the canal is 180·7 cusecs, whereas the present actual discharge is about 146 cusecs with a full supply depth of 4 feet. The Nira Right Bank Canal cuts across the Mhaswad Canal at mile 15 and the old Mhaswad Canal has been remodelled to function as Branch III of the Nira Right Bank Canal passing a discharge of 300 cusecs. No water from the Nira Right Bank Canal is now available for Branch III of the Nira Right Bank Canal system and the irrigation on this branch is being carried out with water obtained from the Mhaswad Tank.

On the 1st April, the level of water in the tank was 19·80 feet (the full supply depth being 24 feet) which diminished to 17·40 feet on 19th September. The tank received replenishment late in October and therefore scarcity of water was felt at the end of Kharif season. Water from the Nira Right Bank Canal was, therefore, obtained to supplement

the Mhaswad Tank supply in the Rabi season so as to meet the demands of the irrigators. The highest level was reached on 30th October.

The rainfall in the Canal tract was 18·31 inches compared with 17·36 inches, the average of the preceding three years.

The following table shows the area irrigated, revenue assessed, etc., during the year as compared with the corresponding averages of the past three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
11,515	9,782	56,767	39,440	12,812	18,493

KHANDESH DIVISION.

JAMDA CANALS.

These canals receive their supply from the Girna river and the supply is supplemented from time to time by water obtained from the Chankapur Tank in the Nasik Irrigation Division. During the year under report no water could be obtained from the Chankapur Tank. The rainfall during the year was 27·45 inches, as compared with 27·88 inches, the average of the preceding three years. The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding average of the preceding three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,386	1,641	10,361	14,718	14,790	17,802

HARTAL TANK.

The tank derives its supply solely from local rains and this supply is precarious. On the 1st April, the storage of the tank amounted to 63·92 million cubic feet and this gradually diminished to 39·12 million cubic feet. The first replenishment which was received on the 19th June raised the contents to 42·39 million cubic feet. The maximum storage of 140·06 million cubic feet was reached on the 6th October. On the 31st March 1938, the storage was 83·93 million cubic feet. The rainfall gauged at the tank was 37·36 inches as compared with 36·37 inches, the average of the preceding three years.

The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
....	28	5	550	899	1,033

Mhaswa Tank.

The tank derives its supply from local rains. On the 1st April, the storage of the tank amounted to 21·79 million cubic feet, which gradually diminished to 15·78 million cubic feet. The first replenishment was received on the 10th July, when the contents increased to 23·67 million cubic feet. The maximum storage of 118·13 million cubic feet was obtained on the 5th October ; on the 31st March, the storage was 5·27 million cubic feet. The rainfall gauged at the tank was 17·46 inches as compared with 24·37 inches, the average of the preceding three years.

The area irrigated, the gross assessed revenue and the working expenses, as compared with the corresponding averages of the preceding three years are given below :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
218	30	3,131	1,137	1,350	1,516

Shahada Channel.

The channel is fed by the Gomai river which has a perennial flow. The rainfall gauged at Shahada was 24·83 inches as compared with 20·73 inches, the average of the preceding three years.

The area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years are given below :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,000	1,008	981	668	11,574	11,189	7,095	6,148

Lower Panjhra River Works.

These works comprise 8 bandharas and 9 channels situated between Dhulia and Betawad on the Panjhra river, and the Mukti Tank, which is situated about 4 miles to the South-West of Dhulia. The channels obtain their supply from the river but when that supply is insufficient, it is supplemented by water obtained from the Mukti Tank.

On the 1st April, the contents of the tank were 232·87 million cubic feet, which gradually diminished to 155·37 million cubic feet. The first replenishment was received on the 15th June, which raised the contents to 156·59 million cubic feet. The maximum storage of 279·16 million cubic feet was reached on the 5th October. The year closed with a storage of 233·26 million cubic feet. The rainfall gauged within the catchment at Dayana and Sadgaon during the year was 17·96 inches as compared with 19·57 inches, the average of the preceding three years.

The subjoined table shows the area irrigated, the gross assessed revenue and the working expenses as compared with the corresponding averages of the preceding three years :—

Area irrigated.				Gross assessed revenue.		Working expenses.	
Patasthal.		Jirayat.					
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
1,275	1,267	1,052	1,147	24,759	25,824	3,617	4,466

NASIK DIVISION.

PARSUL TANK.

This tank is formed by an earthen dam across the Parsul river in the Malegaon taluka of the Nasik District. It depends solely on local rains for its supply. The storage capacity of the tank is 119 million cubic feet with a depth of 35 feet. There is no canal and the irrigation is done by small channels taking off the Parsul river itself downstream of the tank.

On the 1st April, the level of water in the tank was 24·40 feet the corresponding contents being 61·86 million cubic feet. The first replenishment was received on 2nd June 1937. The level of water reached 25·10 feet on the 31st October and continued till 7th November the corresponding contents being 65·06 million cubic feet. The level of water on the 31st March 1938 was 14·45 feet, the corresponding contents being 24·38 million cubic feet. The average rainfall in the catchment area of the tank was 13·69 inches compared with 16·80 inches, the average of the preceding three years.

The following table gives the figures of area irrigated, revenue assessed, etc. during the year as compared with the averages of the past three years :—

Area irrigated.		Gross assessed revenue.		Working expenses.	
1937-38.	Average.	1937-38.	Average.	1937-38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.
636	656	3,197	3,282	1,351	1,580

The cost of the measuring establishment employed was equivalent to 1 anna 4 pies per acre. An expenditure of Rs. 690 was incurred on maintenance and repairs during the year.

SOUTHERN CIRCLE.

BELGAUM DIVISION.

GADIKERI TANK.

The lands under the command of the tank are all assessed at consolidated rates. The area irrigated and the irrigation share of the land revenue assessed were 304 acres and Rs. 2,344, respectively. The working expenses amounted to Rs. 336.

Gokak Canal.

This canal system is the most important irrigation scheme in the Southern Circle and consists of a reservoir formed by a masonry weir across the Ghataprabha river at Dhupdal in the Belgaum District, together with 16 miles of main and branch canals and 36 miles of distributaries. The canal commands an area of 18,668 acres, the area irrigable being 17,627 acres. Although the Dhupdal Storage is mainly intended for irrigating lands under the Canal, a stipulated quantity of water is issued to the Gokak Mills Company in accordance with an agreement between Government and the Company, in consideration of which a sum of Rs. 14,313 is annually paid by the Company subject to a rebate in the event of the supply falling short of the quantity contracted for. During the year under report no rebate had to be paid to the Company.

Water was supplied to the M. & S. M. Railway Company at their Hukeri Road Station at a charge of Rs. 50 per month till 22nd January 1938 and thereafter at Rs. 5 per 10,000 cubic feet of water actually drawn and measured by a meter. The total amount recovered from the Railway Company on this account during the year was Rs. 555.

On the 1st of April, the gauge reading of the water level in the Dhupdal Reservoir was 22·86 feet. The level gradually decreased to 19·76 feet on the 20th June. Owing to replenishment received, the level rose to 22·30 feet on 23rd June causing overflow over the weir on the same night. There was a continuous overflow from 24th June to 15th August except for 4 days from 7th to 10th July. During the whole monsoon the highest flood depth over the crest was 2·44 feet on the 18th July. The maximum discharge for the day was 39,125·43 cusecs. In order to store the water of the post monsoon floods, the raising of the four feet temporary crest excepting the top 2 feet of the 100 reserve bays was commenced on 18th September and completed on 14th October. The closure of 100 reserve bays was carried out from the 15th October to 18th October. Water was conserved from the 18th October when the level was 23·80 feet. The level rose up to 26·06 feet (the full supply level) on 22nd October. This level continued till 21st December and then began to decrease. The level on 31st March 1938 was 20·92 feet.

The following table gives information regarding the area irrigated, revenue assessed, etc., as compared with the average of the previous three years :—

———	Area irrigated.	Gross assessed revenue.	Working expenses.
	Acres.	Rs.	Rs.
Average	7,806	63,039	13,267
1937-38	10,162	74,115	12,452

BIJAPUR DIVISION.

MUCHKUNDI TANK.

This tank is solely dependent on local rains for its supplies and the storage of water in the tank is uncertain owing to the scanty rainfall in the area and the smallness of the catchment. The rainfall recorded during the year, although more than the average of the previous three years, was untimely, as a result of which there was greater demand for tank water. The tank did not get dry during the year. The supply of water in the tank was sufficient for irrigating the lands dependent on it. The highest level of water during the year was R. L. 1,800·54 or 17·10 feet above the sill of the outlet on the 1st January 1937 against the R.L. 1,800·57 or 17·13 feet above the sill of the outlet on the 31st December 1936. The gross assessed revenue was Rs. 891 while the working expenses amounted to Rs. 1,410.

DHARWAR DIVISION.

DAMBAL TANK.

On the 1st April, the water level of the tank was at R. L. 141·87 or 5·67 feet above the silted bed of the tank. The tank received its first replenishment on the 18th April. The highest water level reached during the year was R. L. 145·00 or 8·80 feet above the silted bed. The level of water on the 31st March 1938 was R. L. 139·70 or 3·50 feet above the silted bed of the tank. Due to the work of excavation of the feeder channel from Kadampur North and South nallas and construction of escapes, pick-up weirs, etc., recently done, the tank has been ensured with sufficient water supply for the irrigation under it. The water level in the tank was practically not reduced throughout the year due to pretty good rainfall over the catchment. Many cultivators raised crop under the non-consolidated area of the tank and the yield of the crop was also good, bringing in good revenue. Part of the land dependent on this tank is assessed at water rates, the balance being assessed at consolidated rates. The total area irrigated and the assessment levied under the former head (water rates) were respectively 331 acres and Rs. 1,400 compared with 194 acres and Rs. 762, the corresponding averages of the past three years. The irrigated area under consolidated assessment and the irrigation share of the land revenue assessed were 144 acres and Rs. 916, respectively. The total assessed revenue was Rs. 2,742, while the working expenses amounted to Rs. 9,462.

The work of constructing a feed channel from Kadampur North and South Nallas to Dambal Tank which was in progress during 1936–37 was completed during the year under report.

MEDLERI TANK.

On the 1st April, the water level of the tank was at R. L. 172·08 or 7·08 feet above the sill of the outlet. The tank received its first replenishment on the 27th September and the highest level reached

during the year was R. L. 177·10 or 12·10 feet above the sill of the outlet. The tank was empty from 7th July to 26th September. The water level on the 31st March was R. L. 167·30 or 2·30 feet above the sill of the outlet. The area irrigated and the assessment levied thereon were 46 acres and Rs. 530 as compared with 48 acres and Rs. 550, respectively, the averages of the past three years. The gross assessed revenue was Rs. 661 and the working expenses amounted to Rs. 666.

Madag Tank.

On the 1st April, the water level was nil. The tank received its first replenishment on the 12th July and overflowed from 18th July to 27th November. The highest water level reached during the year was R. L. 1884·86 or 7·15 feet above the crest of the waste weir. The water level on the 31st March was R. L. 1875·37 or 2·11 feet above the sill of the outlet. Water supply was sufficient for hot weather requirement. The area irrigated and the assessment levied thereon were 520 acres and Rs. 2,276, respectively, as compared with 583 acres and Rs. 2,837, respectively, the corresponding averages of the past three years. The decreases both in the area irrigated and the assessment were due to less demand for tank water. The gross assessed revenue amounted to Rs. 4,748 as compared with Rs. 3,146, the average of the previous three years. The working expenses amounted to Rs. 5,448 as compared with Rs. 2,023, the average of the past three years.

Asundi Tank.

The tank was dry at the beginning of the year under report. The tank received its first and full replenishment on 26th September and the highest level reached during the year (on the 10th October) was R. L. 107·00 or 8·00 feet above the sill of the outlet. The level of water on the 31st March 1938 was R. L. 102·00 or 3·00 feet above the sill of the outlet. The lands under this tank are partly assessed at water rates and partly at consolidated rates. The area irrigated and assessment levied thereon under the former head (water rates) was 101 acres and Rs. 627 as compared with 93 acres and Rs. 535, respectively, the corresponding averages of the past three years. The area under consolidated assessment was 182 acres and the irrigation share of land revenue assessed thereon was Rs. 710. The gross assessed revenue amounted to Rs. 1,417 as compared with Rs. 1,531, the average of the previous three years. The working expenses amounted to Rs. 786.

Dharma Canal.

This canal is fed by the Dharma River and a number of tanks are in turn fed by the Canal. The Canal began to flow on 28th June. The first watering was given to crops and by the time it was completed to the satisfaction of the irrigators, the Canal began to go down and

practically failed to meet the increasing demand for water. The rains in the first week of October brought great relief and saved the crop; the Canal began to flow satisfactorily and water was given to all lands from head to tail. The paddy crop was fairly good.

The Canal is an old one. It is also dependent on the rains for its supply. A survey for putting the Canal in proper working order and for construction of a storage reservoir is in progress. The reservoir, when constructed, will lead to an assured supply and bring a larger area under irrigation. Reconstruction of outlets in miles Nos. 5/1 and 6/4 was completed.

The lands commanded by the Canal are assessed partly at water rates and partly at consolidated rates. The area irrigated and the assessment levied thereon under the former head (water rates) was 510 acres and Rs. 2,988, respectively, as compared with 482 acres and Rs. 2,585, respectively, the corresponding averages of the previous three years. The gross assessed revenue (after deducting Rs. 23,156 to be credited to old work) amounted to Rs. 600 while the working expenses amounted to Rs. 1,845 as compared with Rs. 2,392, the average of the past three years.

KANARA DIVISION.

Mavinkop Tank.

The management of this tank has been entrusted to the Revenue Department. The rainfall was 43·35 inches. The supply of water in the tank was adequate for irrigation. The area irrigated which is assessed at consolidated rates amounted to 490 acres and the irrigation share of land revenue was Rs. 2,018 as compared with 479 acres and Rs. 2,045 for the previous year. The working expenses amounted to Rs. 1,742 as compared with Rs. 1,186 during the previous year. The gross assessed revenue was Rs. 2,067.

SECTION II.

COMPRISING IRRIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.

DETAILED REPORTS BY LOCAL OFFICERS.

NORTHERN CIRCLE.

AHMEDABAD, KAIRA AND PANCH MAHALS AND SURAT AND BROACH DIVISIONS.

KHARI SLUICES.

The flow in the Khari river was continuous owing to good floods—the rainfall being adequate. The area of transplantation of rice was 5,862 acres. As the river maintained a good flow throughout the season no difficulty was felt in protecting the whole transplanted area which was brought to maturity. Besides this, a non-himayat paying area of about 454 acres was also irrigated under this system.

The Khari sluices including the Goblaj tank, the Bherai and the Naika reservoirs were maintained in good order at a cost of Rs. 4,590. The sum of Rs. 1,639 was also spent on special repairs to the Goblaj tank and the Bherai reservoir due to breaches in the monsoon. The miscellaneous revenue under the Khari Sluices System amounted to Rs. 207 compared with Rs. 405 received in the previous year.

The following table compares the areas irrigated and the assessment levied during the year with the respective averages of the previous three years :—

	Average.		1937-38.	
	Area.	Revenue after deducting remissions.	Area.	Revenue after deducting remissions.
	Acres.	Rs.	Acres.	Rs.
I. Irrigation above Kalambandhi villages (of Mahij, Bidaj and Lali)	1,191	6,450*	1,688	2,833*
II. Irrigation from tanks that can be fed by the river Khari—				
Goblaj	471	2,976	731	3,434
Galki	235	920	782	569†
III. Irrigation from Khari sluices proper (i.e., 11 Kalambandhi villages)	6,221	16,002	5,862	19,449*
Total ..	8,118	26,348	9,063	26,285

*Revenue represents actual receipts out of the total consolidated revenue.

†A greater part of the assessment remained in arrears.

The assessment in respect of irrigation dependent on the Khari sluices in the Kalambandhi villages is consolidated. The average rates per acre for land and water respectively were as under :—

	Irrigation share.	Land share.	Total consolidated.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Government land	0 5 4	5 1 11	5 7 3
Alienated land	0 5 4	1 13 1	2 2 5

Muvalia Tank.

This is an important tank situated in the vicinity of Dohad town in the Broach and Panch Mahals Collectorate and it has a catchment area of about 30 square miles. During the year under review, it received a favourable replenishment. The area irrigated was 1,098 acres and the net assessment amounted to Rs. 3,170. The miscellaneous revenue amounted to Rs. 81 compared with Rs. 1,017 received in the previous year. The amounts of Rs. 2,819 and Rs. 88 were spent for (1) lowering Left Bank Canal of Muvalia Tank and (2) for lowering the sill of the masonry outlet of Left Bank Canal of Muvalia Tank.

Old Tanks.

Improvements to 9 tanks in the Kaira and Panch Mahals Division and repairs to 23 tanks in the Ahmedabad Division, 31 tanks in the Kaira and Panch Mahals Division and 36 tanks in the Surat and Broach Division were carried out at a total cost of Rs. 17,637 and Rs. 51,964 respectively. The areas irrigated and the revenue derived from the old irrigation tanks and bunds were as under :—

Name of Collectorate.	Area irrigated.	Revenue.		Total consolidated assessment.
		Irrigation share.	Land share.	
	Acres. G.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Ahmedabad	14,020 0	16,269 0 0	46,762 0 0	63,031 0 0
Kaira	656 0	1,123 0 0	203 0 0	1,326 0 0
Panch Mahals	270 0	689 0 0	1,436 0 0	2,125 0 0
Broach	769 0	1,481 0 0	5,015 0 0	6,496 0 0
Surat	3,101 25	6,684 7 3	32,432 7 2	39,116 14 5
Total ..	18,816 25	26,246 7 3	85,848 7 2	1,12,094 14 5

Drainage Channels.

The drainage channels in the Ahmedabad, Kaira and Panch Mahals and Surat and Broach Divisions, were maintained in good order at a cost of Rs. 8,010, Rs. 6,998 and Rs. 4,495, respectively.

DECCAN IRRIGATION CIRCLE.

POONA IRRIGATION DIVISION.

Rakh Tank.

This tank is situated about 5 miles from Walha railway station of the Madras and Southern Mahratta Railway and is formed by an earthen dam constructed across a nala near Rakh village in Purandhar Taluka of the Poona District. The catchment area of the tank is 5·38 square miles and its capacity is only 34·2 million cubic feet. The tank has two channels of a total length of $3\frac{5}{8}$ miles. The area under command on channel No. 1, which is on the left bank, is 265 acres and that on channel No. 2 is 321 acres. The main channel is designed to discharge 12·8 cusecs leaving sufficient margin for all losses in transit. An area of 200 acres was irrigated and the revenue assessed amounted to Rs. 914 as compared with 84 acres and Rs. 518, respectively during the previous year.

Khamgaon Tank.

This tank which is situated in mile 23 of the Mutha Right Bank Canal is only partially completed, received replenishment during the monsoon from the Mutha Right Bank Canal Distributary No. 17. The supply available was issued for the irrigation of 298 acres and the irrigation revenue assessed was Rs. 1,448, the corresponding figures for the previous year being 353 acres and Rs. 1,395, respectively. The gross assessed revenue amounted to Rs. 1,498.

Effluent Irrigation on the Mutha Right Bank Canal.

The total area of sugarcane irrigated on effluent during the year was 315 acres as compared with 1,164 acres during the previous year. The average discharge pumped during the year was 8·55 cusecs out of which 8·15 cusecs were utilised for purposes of irrigation and the balance of ·40 cusec was run off to the winter disposal area. The total area irrigated was 780 acres as compared with 1,474 acres during the previous year. The assessed revenue amounted to Rs. 25,517 as compared with Rs. 53,538 during the previous year. The rate for the supply of effluent for sugarcane was Rs. 60 per acre during the year under report.

Bandharas (Poona District):

Bandharas are small weirs built across streams in order that the level of the water flowing in the streams may be raised sufficiently to command the lands to be irrigated. The following table gives the area irrigated and the consolidated assessed revenue on the bandharas irrigation works in the Poona Collectorate during the year as compared with the average of the past three years :—

Particulars.	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1937-38	2,793	14,104	4,897	19,001
Average	2,767	14,272	4,934	19,206

Bandharas (Nasik District).

There are numerous bandharas situated in this District. There are in all 299 such bandharas on the list. The expenditure incurred on repairs to bandharas (48 in number) during the year amounted to Rs. 44,527. The following table gives the area irrigated and the consolidated assessed revenue during the year as compared with the averages of the past three years :—

Particulars.	Area irrigated.	Consolidated revenue.		
		Irrigation share.	Land share.	Total.
	Acres.	Rs.	Rs.	Rs.
1937-38	27,472	1,82,728	54,133	2,36,861
Average	27,388	1,77,015	50,778	2,27,793

AHMEDNAGAR DIVISION.

VISAPUR TANK.

The Visapur Tank dam which is situated about 2 miles from the Visapur railway station on Dhond-Manmad Railway line is built across the Hanga river, a tributary of the Bhima river. It was started as a famine relief work in 1896 and was subsequently completed in successive stages by criminal tribes and convict labour by June 1927. This earthen dam which is 7,440 feet long and 84 feet high, forms a lake having a net capacity of 1,136 million cubic feet. The estimated cost of the whole scheme was Rs. 41 lakhs of which a sum of Rs. 21 lakhs was spent on the dam and head works and the balance on the construction of the canal, distributaries and minors, which aggregate 46 miles in length. The total area under command is 95,000 acres of which 26,000 acres are irrigable. The catchment area of the tank is 159 square miles in extent and it has a capacity of 1,172 million cubic feet. The irrigation from this tank was first started during the rabi season of 1929–30. Owing to an increased demand for water due to the starting of a small sugar factory on the Chimbla Distributary, the waste weir was raised by 2 feet in March 1934 to increase the storage in the tank by 130·20 million cubic feet. The yield from the catchment (159 square miles) was 1,233·43 million cubic feet during the year, the average rainfall being 23·46 inches.

On the 1st April, the level of water in the tank was 16·05 feet above the sill of the outlet, the contents being 232·39 million cubic feet. The lowest level of 12·25 feet was reached on the 18th April 1937, the corresponding contents then being 214·36 million cubic feet. Replenishment was received in the tank on the 19th April, the corresponding contents being 317·30 million cubic feet. The level again dropped to 19·70 feet on the 12th June the contents being 170·22 million cubic feet. The highest level of 41·90 feet was reached on the 5th October with a storage equivalent to 1,262·86 million cubic feet. On the 31st March 1938, the level of water in the tank was 35·80 feet, the corresponding contents being 1,034 million cubic feet. There was no flow over the waste weir during the year as the replenishment was not sufficient to fill the tank. The area irrigated, the irrigation assessment and the gross assessed revenue were 1,846 acres, Rs. 13,531 and Rs. 19,415 as compared with 1,723 acres, Rs. 15,836 and Rs. 20,670, respectively, the averages of the past three years. The expenditure incurred on maintenance and repairs to the tank and canal amounted to Rs. 7,315.

KUNTEPHAL TANK.

This is a very small tank with a capacity of about 57 million cubic feet. It is situated on a small nala near Shevgaon about 45 miles from Ahmednagar and it is entirely dependent for its supply on local rains.

The tank was dry up to 18th April. The first replenishment was received on 18th April raising the water level to 8·20 feet, the corresponding contents being 14·08 million cubic feet. The lowest level reached was 3·80 feet, the contents then being 2·93 million cubic feet. Replenishment was received on the 20th June and the level rose to 5 feet equivalent to a storage of 4·81 million cubic feet. The highest water level of 12·75 feet was reached on the 9th October. The water level on 31st March 1938 was 6·60 feet, the corresponding contents being 8·66 million cubic feet. The rainfall during the year was 20·77 inches as compared with 23·35 inches, the average of the past 3 years. Only 4 acres 20 gunthas were irrigated during the rabi season and the revenue assessed was Rs. 13–8–0. The expenditure incurred on maintenance and repairs amounted to Rs. 923.

Mandavgan Tank.

This tank is situated on a nala about 2½ miles away from Mandavgan village, taluka Shirgonda in the Ahmednagar District. The earthen dam is 1,605 feet in length. The tank has a hilly catchment of about 5·32 square miles. It is entirely dependent on local rains for its supply of water. This tank has been taken over from the District Local Board, Ahmednagar, from the rabi season of 1932–33, for irrigation management Replenishment was received on the 8th October, the corresponding contents being 45·48 million cubic feet. The area irrigated and the water rates assessed during the year were 91 acres and Rs. 411, respectively, as compared with 75 acres and Rs. 325, respectively, during the previous year. The expenditure incurred on maintenance and repairs amounted to Rs. 1,013.

CENTRAL CIRCLE.

The area irrigated and the gross assessed revenue on small tanks were 942 acres and Rs. 5,217, respectively. The area irrigated and the irrigation share of revenue on the old bandharas and channels in the Khandesh Division were 8,677 acres and Rs. 65,130, respectively.

SHOLAPUR DIVISION.

Wadshivne Tank.

On the 1st April, the level of the water in the tank was below the sill of the outlet and this level gradually rose to 453·86 which was the highest level reached on the 6th October.

During the year under report, the area irrigated and the gross assessed revenue were 825 acres and Rs. 4,449 as compared with 404 acres and Rs. 1,889, the corresponding averages of the previous three years,

KHANDESH DIVISION. .

TALWADA TANK.

The supply in this tank is generally uncertain. On the 1st April, the tank was dry. The first replenishment was received on the 22nd June, when the contents were 1·76 million cubic feet. The maximum storage of 5·50 million cubic feet was reached on the 31st December.

The rainfall gauged at the tank was 17·06 inches as compared with 13·64 inches, the average of the preceding three years. The area irrigated was only 1 acre and the gross assessed revenue amounted to Rs. 176. The revenue realised from water rates during the year was Rs. 9 only, the miscellaneous realisations being Rs. 167. The expenditure incurred on the maintenance and repairs to the tank and canal was Rs. 400.

OLD WORKS.

The old bandharas and channels are grouped as under :—

1. The Upper Panjhra river group including in Gondur Tank.
2. The Kan river group.
3. The Burai river group.
4. The Girna river group.
5. The Bori river group.

The subjoined table shows the area irrigated and the revenue derived from these works as compared with the averages of the preceding three years :—

Area irrigated.		Revenue.				Total.	
		Irrigation share.		Land share.			
1937–38.	Average.	1937–38.	Average.	1937–38.	Average.	1937–38.	Average.
Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
8,677	8,648	65,130	65,091	13,188	13,182	78,318	78,273

The expenditure on these bandharas was as under :—

	Rs.
Extensions and improvements	234
Repairs	200

An expenditure of Rs. 203 was also incurred on river and rain gauge operations during the year.

NASIK DIVISION.

KHIRDI SATHE TANK.

This is a small tank in Yeola Taluka of the Nasik District. The tank is formed by an earthen dam and is dependent on local rains for its supply, which is generally sufficient for crops grown during the monsoon and rabi seasons.

On the 1st April, the level of water in the tank was below the sill and the tank was practically dry. The level stood at R. L. 215·00 from 9th March to 22nd May. Replenishment commenced on the 20th June and the water level rose to 11·20 feet above the sill on the 1st of November, the contents being 27·5 million cubic feet. The draw off for irrigation purposes commenced on the 23rd November when the level of water was 9·90 feet and the contents 22·24 million cubic feet. On the 31st March the level of water was 2 feet above the sill, the contents being 2·36 million cubic feet. The area irrigated during the year was 116 acres as compared with 345 acres, the average of the previous three years. The decrease was due to the shortage of rainfall. The assessed revenue amounted to Rs. 592 as compared with Rs. 3,035, the average of the previous three years.

SOUTHERN CIRCLE.

BELGAUM DIVISION.

There are approximately 525 second class irrigation tanks situated in the Belgaum Division. During the year under report repairs to 43 tanks were carried out at a cost of Rs. 21,917 and in addition to this sum, an expenditure of Rs. 2,166 was incurred on the survey of the old tanks. The area irrigated during the year was 10,835 acres, the irrigation share of land revenue being Rs. 99,815. The total direct and indirect receipts amounted to Rs. 1,00,034 as compared with Rs. 1,16,184 during the previous year. The remissions sanctioned during the year amounted to Rs. 30,135.

BIJAPUR DIVISION.

There are about 12 second class irrigation tanks in this Division. During the year under report an expenditure of Rs. 3,036 was incurred on repairs to 3 Tanks. The area irrigated during the year was 996 acres and the irrigation share of land revenue amounted to Rs. 5,026. The remissions granted during the year amounted to Rs. 377. The total direct and indirect receipts during the year under report were Rs. 5,557 as against Rs. 6,532 for the previous year.

DHARWAR DIVISION.

There are about 2,931 Second Class Irrigation tanks. During the year under report an expenditure of Rs. 30,755 was incurred on repairs to about 56 tanks and a sum of Rs. 3,457 was spent on extensions and improvements, etc. The area irrigated during the year was 48,790 acres and the irrigation share of land revenue amounted to Rs. 1,74,189. The remissions granted during the year amounted to Rs. 57,513. The total direct and indirect receipts were Rs. 1,28,475 as compared with Rs. 1,31,585 for the previous year.

KANARA DIVISION.

In this Division there are about 2,128 second class irrigation tanks. During the year, an expenditure of Rs. 10,262 was incurred on repairs to 41 tanks. In addition, a sum of Rs. 2,599 was spent on " surveying irrigation tanks and preparing projects for their improvements ". The area irrigated during the year was 31,649 acres and the irrigation share of land revenue was Rs. 94,120, the whole of which was realised during the year.

RATNAGIRI DIVISION.

There are only three tanks in this Division. The area irrigated was 1,161 acres and the irrigation share of land revenue was Rs. 5,472, the whole of which was realised during the year.

SECTION III.

IRRIGATION RESEARCH DIVISION.

In the Deccan, when a large perennial canal is opened, widespread water-logging is liable to ensue. Some of this water-logging dries out later, but the damage often extends rapidly into the valleys, and unless steps are taken to set matters right, the damage, consisting mainly of salt-efflorescence, becomes permanent. The seriousness of the menace was realised as early as 1888 and the controversy regarding the relative effect of channel losses and wasteful irrigation and the best methods to adopt to safeguard the land became yearly more acute. Various experiments were carried out at the instance of the Agricultural Department but by 1913 it was clear that all the methods tried so far had failed. It was eventually decided to open a Special Irrigation Division in order that the question of canal development, especially as regards safeguarding the soil, might form the subject of investigation. In June 1916, the Division (now called the Irrigation Research Division) was formed and the work entrusted to it was the contouring of the commanded areas, the carrying out of a careful survey and classification of the surface and sub-soil, the selection and marking out of definite areas suitable for "blocks" for perennial and other crops, the designing of the drainage works required, the indication of suitable lines of communication and centres for the establishment of crushing, grinding, and refining and other machinery for trade purposes and the study of the question of the reclamation of waste lands and areas damaged by water-logging and salt-efflorescence and the growth of useful timber in such tracts and along the main canal. In short, research and investigation into all the problems relating to irrigation by means of actual experiment has been the sphere of work of this Division.

The investigations coming within this sphere may be broadly grouped under four heads, viz. :—

(1) Irrigation management,

(2) Irrigation requirements or the inter-action of agricultural requirements and irrigation limitations,

(3) Soil physics of irrigated tracts, as affecting,

(4) Drainage and reclamation.

The work done by this Division may be classified as under :—

(1) Sub-soil survey and observation of sub-soil water levels,
(2) Irrigation and blocks,
(3) Sub-soil drainage construction,
(4) Drainage schemes for allotted sugar factory areas,
(5) Irricultural research,

A brief account of the work done during the year under each of these heads is given below :—

(1) Sub-soil Survey and Observations of Sub-soil Water Levels.

The observations of damage and well water levels on the Godavari, the Pravara and the Nira Canals were continued. The damage has increased due to the concentration of sugarcane by the Sugar Companies and in order therefore to protect lands from damages construction work of drainages in some of the factory areas has been commenced. Safe limits of sugarcane areas to be allowed on each distributary of the Godavari Canals and for some area on the Nira Left Bank Canal were investigated.

(2) Irrigation and Blocks.

Individual inspection of lands as regards the drainage and the suitability of the soil for fruit-gardens for which applications were received were carried out during the year. Applications for the exemption from the rule disallowing perennial irrigation within one-fourth mile limit of towns and villages were investigated.

(3) Sub-soil Drainage Construction.

Detailed observations were made in the areas served by the drainage schemes already constructed. The improvement in the condition of the damaged areas continues. The construction work of the following drainage works were in progress during the year :—

(1) Manjri Drainage Scheme (Mutha Right Bank Canal).

(2) Deolali Drainage Scheme (Pravara Right Bank Canal).

(3) Douch Drainage Scheme (Godavari Canals).

(4) Nandur-Khandala Drainage Scheme (Pravara Left Bank Canal).

(4) Drainage Schemes for allotted Factory Areas.

Considerable progress was made in the projects for land drainage in the allotted sugar factory areas and plans and estimates for several projects of drainage schemes in respect of the various Sugar Factories on the Deccan Canals were prepared and the construction work of drainages was in progress in the Belapur Company, the Saswad Mali Sugar Factory and Phaltan Sugar Works area. A careful watch is being kept on the factory areas in many catchments of which full sugarcane concentration has been reached.

(5) Irricultural Research.

In the Hadapsar Effluent Experimental Area, field experiments were carried out with a view to finding out the best varieties of sugarcane and the most suitable treatment and methods of cultivation of sugarcane manured by effluent. The question of the disposal of the increasing quantity of effluent by more concentrated and prolonged application and the effect on the soil of effluent manuring year after year was also under investigation.

In the Baramati Experimental Salt Area, field experiments on soil reclamation after drainage based on the data from laboratory and plot scale experiments were carried out. Method of cultivation, fertilizers, green manures and sugarcane varieties suited to the process of reclamation were tested with satisfactory results. This research has wide application on the damaged areas on the Deccan Canals.

STATEMENT

Statement of Area irrigated by Irrigation Works in the Province

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	Acres	Acres.	Acres.	Acres.	Acres.	Acres.	
	PRODUCTIVE.							
	Southern Circle.							
1	Gadikeri Tank	*304	..	*304	*304	..	..	..
2	Mavinkop Tank	*490	..	*490	*490	..	..	..
	Central Circle.							
3	Ekruk Tank	(2,069)	(1,545)	(3,614)	4,169	48	..	..
		2,186	2,031	4,217				
4	Shahada Channel	(365)	(602)	(967)	981	..	28	1·41
		371	610	981	..			
		*673	*327	*1,000	*1,000			
	Total, Productive ..	2,557	2,641	5,198	5,150	48	28	..
		*1,467	*327	*1,794	*1,794			
	UNPRODUCTIVE.							
	Northern Circle.							
5	Hathmati and Khari Cut Canal ..	1,747	3,722	5,469	5,429	40	..	..
		14,067	447	14,514	14,131	383	..	..
6	Wangroli Tank	1,379	527	1,906	1,845	21	..	..
7	Savli Tank	1,820	..	1,820	1,813	7	..	..
8	Sahiat Tank	463	128	591	590	1	..	..
9	Tranza-Nagrama Tanks	2	..	2	..	2	..	..
10	Futelao Tank	57	51	108	108	..	..	..
	Deccan Irrigation Circle							
11	Nira Left Bank Canal	(34,334)	(48,943)	70,612	70,296	316	392	·55
		41,620	28,992					
	Shetphal Tank	(4,059)	(4,808)	7,147	7,146	1	41	·57
		4,774	2,373					
12	Nira Right Bank Canal	(28,331)	(26,733)	41,543	41,512	31	24	·005
		21,019	20,524					

I-E.

of Bombay, during the year 1937-38.

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..	15th February to 14th October.	15th October to 14th February.
..	..	..	..	..	..	..	..		
15·07	21·12	15·07	21·12	157	101	157	101	Do. ..	Do.
6·66	18·42	6·66	18·42	163	69	163	69	Do. ..	Do.
..	..	..	..	..	..	..	..		
†191	‡108	†66	‡95	9·14	34·46	26·5	39·18	15th June to 15th November.	16th November to 14th February.
147	20	147	20	95·69	22·35	95·69	22·35		
106·06	59·25	106·06	59·25	12·99	8·91	12·99	8·91	Do. ..	Do.
143·68	..	143·68	..	12·67	..	12·67	..	Do. ..	Do.
41·37	5·13	41·37	5·13	11·12	24·95	11·12	24·95	Do. ..	Do.
Nil.	*Nil.*	..	..	..	..	..	..	Do. ..	Do.
Nil.	..	*Nil.*	..	5	8	5	8	Do. ..	Do.
442	491	359	467	78	100	(*h*) 96	(*h*) 105	15th February to 14th October.	15th October to 14th February.
30	34	30	34	106	97	106	97	Do. ..	Do.
325	430	236	287	(*a*) 87	(*a*) 62	(*a*) 120	(*a*) 93	Do. ..	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*contd.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*contd.*							
	Deccan Irrigation Circle—contd.							
13	Mutha Canals	(10,579) 11,943	(5,054) 2,220	14,163	13,872	291	..	..
	Matoba Tank (e)	(1,046) 1,183	(2,324) 2,145	3,328	2,328	..	..	..
14	Karsudi Tank (e)	(7) 7	(14) 15	22	22	..	..	..
15	Shirsuphal Tank (e)	(100) 115	(663) 692	807	888	..	..	..
16	Bhadalwadi Tank (e)	(456) 478	(945) 992	1,470	723	..	..	..
17	Lake Beale—Darna Dam	(304) 304	(121) 121	425	..	425	..	..
	Godavari Right Bank Canal ..	(12,733) 19,113	(10,188) 2,433	21,546	21,341	205	1,736	8·06
	Godavari Left Bank Canal ..	(7,723) 12,010	(7,175) 2,542	14,552	12,673	1,879	1,615	11·10
18	Chankapur Tank—Girna Canal	(5,425) 6,407	(4,987) 3,941	10,348	10,330	18	..	..
19	Kadwa River Works — Palkhed Canal ..	(1,167) 1,301	(1,503) 1,346	2,647	2,634	13	..	..
	Kadwa River Works — Ojhar Tambat Canal	(573) 635	(758) 527	1,162	1,162	..	..	..
	Kadwa River Works — Wadali Canal ..	(598) 654	(583) 292	946	946	..	..	..
20	Pravara Right Bank Canal ..	(7,008) 8,765	(4,605) 945	9,710	9,710	..	607	6
	Pravara Left Bank Canal ..	(21,968) 26,767	(19,719) 8,032	34,799	34,592	207	1,616	5
21	Bhatodi Tank (e)	(111) 121	(425) 463	584	584	..	..	..

I-E—*contd.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
167	105	(c)	82	(d) 63	(d) 48	(c)	(h) 62	15th February to 14th October.	15th October to 14th February
14·4	18·8	14·4	18·8	75	129	84	119	Do. ..	Do.
..	..	..	..	..	..	..	..	Do. ..	Do.
2·7	5·6	2·7	5·6	37	118	43	124	Do. ..	Do.
4·8	5·7	4·8	5·7	95	166	100	174	Do. ..	Do.
..	..	..	..	..	..	..	..	Do. ..	Do.
204	204	204	204	62	50	62	50	Do. ..	Do.
100	116	100	116	77	62	77	62	Do. ..	Do.
72	96	72	96	75	52	75	52	Do. ..	Do.
17	22	17	22	69	68	69	68	Do. ..	Do.
9	8	9	8	64	94	64	94	Do ..	Do.
4	7	4	7	149	83	149	83	Do. ..	Do.
70·18	69·32	66·37	67·40	(b) 100	(b) 66	(b) 106	(b) 68	Do. ..	Do.
310·34	354·42	292·45	337·73	(b) 71	(b) 155	(b) 75	(b) 58	Do. ..	Do.
4·33	2·92	3·88	2·88	(f) 26	(f) 146	(f) 29	(f) 149	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*contd.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*contd.*							
	Central Circle.							
22	Mhaswad Tank	(4,919) 5,089	(6,207) 6,426	11,515	11,502	13	..	..
23	Parsul Tank (c)	(424) 439	(131) 197	636	636	..	..	..
24	Koregaon Tank	.. ..	(317) 354	354	336	18	..	..
25	Ashti Tank	(2,108) 2,321	(1,257) 1,430	3,751	3,748	3	..	..
26	Pathri Tank	(132) 172	(532) 607	779	754	25	..	..
27	Jamda Canals	(482) 525	(804) 861	1,386	1,382	4	..	..
28	Hartala Tank	Nil. ..	(g) (5) ..	..	..	..	..	..
29	Mhaswa Tank	.. ..	(210) 218	218	215	3	..	..
30	Lower Panjhra River Works	(286) 297 *1,148	(745) 755 *127	1,052 *1,275	1,052 *1,275	..	730	31·37
31	Krishna Canal	(2,565) 3,011	(1,145) 1,328	4,339	3,809	530	57	1·54
32	Rewari Canal	(35) 45	(490) 561	606	605	1	9	1·71
33	Upper Man River Works	(184) 224	(734) 852	1,076	1,073	3	28	3·40
34	Yerla River Irrigation Works	(363) 438	(2,495) 2,921	3,359	3,314	45	224	7·83
35	Chikhli Canal	(141) 176	(85) 103	279	276	3	13	5·75
36	Maini Tank	(65) 288	(1,090) 1,221	1,509	1,493	16	19	1·64

I-E—*contd.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
68	127	68	127	74	51	74	51	15th February to 14th October.	15th October to 14th February.
2	3	2	3	203	66	203	66	Do. ..	Do.
..	2·08	..	2·08	..	152	..	152	Do. ..	Do
7·16	4·95	7 16	4·95	295	258	295	258	Do. ..	Do.
0·32	3·34	0·32	3·34	412	159	412	159	Do. ..	Do.
20·14	37·04	20·14	37·04	25	32	25	32	Do. ..	Do.
..	0·005	..	0·005	..	1,000	..	1,000	Do. ..	Do.
·05	3·63	·05	3·63	..	57	..	57	Do. ..	Do.
1·93	1·99	1·93	1·99	760	613	760	613	Do. ..	Do.
41·08	71·65	41·08	71·65	81	50	81	50	Do ..	Do.
0·86	4·25	0·86	4·25	42	128	42	128	Do. ..	Do.
0·76	4·00	0·76	4·00	247	190	247	190	Do. ..	Do.
2·84	11·80	2·84	11·80	146	231	146	231	Do. ..	Do.
0·56	1·25	0·56	1·25	262	140	262	140	Do. ..	Do.
0·15	3·89	0·15	3·89	440	289	440	289	Do. ..	Do.

STATEMENT

No.	Name of work.	Area irrigated.					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT —*concld.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	*UNPRODUCTIVE—*contd.*							
	Southern Circle.							
37	Gokak Canal—First Section	7,052	3,110	10,162	9,881	281	1,104	10·86
38	Muchkundi Tank	15	..	15	15	..	..	..
39	Dambal Tank	217 *144	114 ..	331 *144	331 *144	..	..	..
40	Medleri Tank	28	18	46	37	9	..	..
41	Madag Tank	298	222	520	520	..	..	..
42	Asundi Tank	..	101 *182	101 *182	98 *182	3	..	..
43	Dharma Canal	510 *5,227	..	510 *5,227	510 *5,227	..	..	..
	Total, Unproductive ..	197,896 *6,519	104,869 *309	302,765 *6,828	296,262 *6,828	4,797	8,215	2·65
	Grand Total, Productive and Unproductive	200,453 *7,986	107,510 *636	307,963 *8,622	301,412 *8,622	4,845	8,243	2·60

Note.—The bold figures in brackets represent areas actually irrigated during the respective seasons and the duties have crops are irrigated. To obtain correct duties therefore these crops have to be added to the rabi areas.

(*a*) Low duties on the Nira Right Bank Canal are due to scattered nature of irrigation.

(*b*) The duties on the Pravara Canals are low due to high proportion of sugarcane and other perennial crops.

(*c*) Figures of " utilized " discharge are not available, as the quantity let into the Matoba Tank could not be acurately

(*d*) The low duties are due to high proportion of perennial irrigation.

(*e*) There is generally no supply in the Kasurdi, Shirsuphal, Matoba, Bhadalwadi, Parsul and Bhatodi Tanks in the hot and other causes. The actual number of days on which the channels were in flow has therefore been taken

(*f*) The high duties on the Bhatodi Tank are due to concentrated irrigation on small channel, and because major

(*g*) The area of 5 acres under the Hartala Tank having received pre-seasonal waterings of kharif, is being assessed

(*h*) The difference between the discharge at head and utilized in respect of the Nira Left Bank Canal was due to water the Mutha Canals it was due to water having run to waste through escapes, etc.

*Area under consolidated assessment.

†125 (191 − 66 = 125) cusecs were supplied to the Khari Cut Canal through Bhuiwa Channel to Bokh Reservoir.

‡108-95-13 cusecs were utilised in replenishing the Bokh Reservoir for irrigation under the Khari Cut Canals and

I-E—*concld.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
43·35	48·92	43·35	48·92	148	114·27	148	114·27	15th February to 14th October.	15th October to 14th February.
..	..	..	..	..	..	..	..	Do. ..	Do.
3·8	4·4	3·8	4·4	95·00	25·90	95	25·90	16th January to 15th October.	16th October to 15th January.
0·19	1·19	0·19	1·19	147·37	15·13	147·37	15·13	Do. ..	Do.
1·5	4·1	1·5	4·1	198·67	54 15	198·67	54·15	Do. ..	Do.
..	4·45	..	4·45	..	63·60	..	63·60	Do. ..	Do.
38·3	19·8	38·3	19·8	149·8	..	149·8	..	Do. ..	Do.
..	..	..	..	..	..	..	..		
..	..	..	..	..	..	..	..		

been calculated on these figures. In the rabi season in addition to pure rabi crops, perennial and eight months

measured.

weather season. Even during the monsoon and rabi seasons the channels are closed for days together due to rainfall for purpose of calculating average discharge and duties. No discharge could be worked out on the Kasurdi Tank.

portion of irrigation is seasonal.

in the Kharif of 1938-39.

having been let into the Shetphal Tank and run to waste through scouring sluices. In regard to the Pravara Canals and

Khari Sluices in Rabi and Hot seasons.

STATEMENT I-F.

Statement showing water-rates per acre in force during 1937-38 on Irrigation Works in the Province of Bombay

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	PRODUCTIVE.											
	Southern Circle.											
1	Gadikeri Tank* ..	..	..	..	..	..	..	..	..			
2	Mavinkop Tank* ..	..	..	..	..	..	..	..	..			
	Central Circle.											
3	Ekruk Tank a ..	..	A 35 B 17½	8	3	5	7	..	2	*Nil.*	*Nil.*	*Nil.*
4	Shahada Channel a ..	..	A 28 B 14	8	3	5	6	..	2			
	UNPRODUCTIVE.											
	Northern Circle.											
	Hathmati Canal a^1 ..	..	(b^4)	..	D 3 E 1	3	6	..	2			
5	Khari Cut Canal a^1..	..	(b^4)	..	D 7 E 1	5	6	..	1 **2			
6	Wangroli Tank a^3 ..	..	(b^4)	6½	D 5 E 2½	4	6	..	1½			
7	Savli Tank a^4 ..	..	(b^4)	8	D 5 E 4	4	6	..	1½			
8	Saiat Tank a^5 ..	..	(b^4)	6½	D 4 E 2½	4	6	..	1½			
9	Tranza Nagrama Tanks, a^8	..	(b^4)	6	D 4 E 2	4	6	..	1			
10	Futelao Tank a^6 ..	..	(b^4)	..	D 4 E 2	a^7 3 a^8 2	5	..	a^9 1	*Nil.*	*Nil.*	*Nil.*
	Deccan Irrigation Circle.											
11	Nira Left Bank Canal Shetphal Tank (*d*) ..	§19 ¶16	M 45 C 66 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½		(*e*) 2			
12	Nira Right Bank Canal (*d*).	§19 ¶16	M 45 C 6 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½		(*e*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water rates.							Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
		Irrigation in blocks.	Perennial.	Two Seasonal.	four Monsoon, months.	Rabi, four months.	Hot weather.	Miscellaneous.				
	Works for which Capital and revenue Accounts are kept—*contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle—contd.											
13	Mutha Canals and Matoba Tank (*c*)—											
	Sugarcane under the Mutha Canals within the Poona City and Suburban Municipal and Cantonment limits or within one mile of those limits.	..	50	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½	..	(*e*) 2	Nil.	Nil.	Nil.
	On all remaining land commanded by both the canals.	..	M 45									
	Pan gardens ..	..	C 66									
	Perennial crops other othan sugarcane and pan gardens.	..	B 22½									
	Pomegranates ..	..	15									
	Matoba Tank ..	..	(*f*)									
14	Kasurdi Tank (*d*) ..	..										
15	Shirsuphal Tank (*d*)	..	X	8	3	5	6	..	(*e*) 2	Nil.	Nil.	Nil.
16	Bhadalvadi Tank (*d*)	..										
17	Godavari Right Bank Canal (*b*)	§19 ¶16	M 45 C 66	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½	..	(*e*) 2			
	Godavari Left Bank Canal (*b*).		B 22½ K 15									
18	Chankapur Tank—Girna Canal (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates							Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
		Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.				
	Works for which Capital and Revenue Accounts are kept—*contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle—concld.											
19	Kadwa River Works (*d*)—											
	Waghad Tank ..	..										
	Palkhed Canal ..	..										
	Ojhar-Tambat Canal.	..	X	8	3	5	6	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
	Wadali Canal ..	..										
20	Pravara Canals (*b*) ..	§19 ¶16	M 45 C 66 B 22½ K 15	Light 8 Med. 12	Light 3 Med. 4½	Light 5 Med. 7½	Light 7 Med. 10½	..	(*e*) 2			
21	Bhatodi Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			
	Central Circle.											
22	Parsul Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			
23	Koregaon Tank a ..	..										
24	Ashti Tank a ..	..	A 28	8	3	5	6	..	(*e*) 2			
25	Pathri Tank a ..	..	B 14									
26	Mhaswad Tank (*d*) ..	..	X	8	3	5	6	..	(*e*) 2			
27	Jamda Canals a ..	..										
28	Hartala Tank a ..	..	A 28	8	3	5	6	..	(*e*) 2			
29	Mhasva Tank a ..	..	B 14									
30	Lower Panjhra River Works a ..	..										
31	Krishna Canal a ..	..	A 32 B 16	8	3	5	8	..	(*e*) 2			
32	Revari Canal a ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
33	Upper Man River Works. a ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2	*Nil.*	*Nil.*	*Nil.*
34	Yerla River Irrigation Works. a ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
35	Chikhli Canal a ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			
36	Maini Tank a ..	..	A 28 B 14	8	3	5	6	..	(*e*) 2			

STATEMENT I-F—*concld.*

No.	Name of Work.	Water rates. Irrigation in blocks.	Perennial.	Two Seasonal.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept— *concld.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*concld.*											
	Southern Circle											
37	Gokak Canal, 1st Section and Storage Works (*u*).	..	(*b*[1]) 27½ (*b*[2]) 20	8	3	5	.15	..	2	*Nil.*	*Nil.*	*Nil.*
38	Muchkundi Tank (*s*) ..	..	10	5	2	2	5	..	1			
39	Dambal Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
40	Medleri Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
41	Madag Tank (*w*) ..	..	(*x*) 12	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
42	Asundi Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
43	Dharma Canal (a[10]) ..	..	..	..	(*o*) 4½	..	..	..	(*k*) 1 (*j*) 2			

NOTE.—(1) For lift irrigation in the Deccan Irrigation Circle the orders contained in G. R. No. 4771/27, dated 23rd December 1931, are that lift from Budkis should not be allowed at all in areas under the flow command of a canal and that in other areas it may be allowed only when the supply of water for irrigation is in excess of the demand at half the flow rates for all crops other than sugarcane for which full rate should be charged.

(2) For lift irrigation half the ordinary rates are charged in other circles.

(3) Double or treble the ordinary rates are charged as penal rates for taking water without permission.

(4) Leakage or percolation rates are the same as ordinary rates.

(5) Water-rates for non-irrigational purposes are charged at the rates sanctioned by Government in each case.

(6) In the D. I. C. monsoon or two seasonal crops which take pre-seasonal waterings between the 25th April and the break of the monsoon are charged the following water rates per acre according to the date of first watering applied for and sanctioned, *vide* G. R. No. 5602/27, dated 9th December 1931 :—

Water taken from the date	Rate for light type of crops. Rs.	Rate for medium type of crops. Rs.
25th April	5	7½
5th May	4	6
15th May	3	4½

(7) A reserve rate of Rs. 3 per acre as a minimum rate has been sanctioned for lands let out for cultivation in the basin of Lake Beale—*vide* G. R. No. 2484, dated 12th June 1925.

(8) A flat rate of Rs. 2-8-0 per acre of culturable area has been sanctioned for the supply of water from the irrigation channel of Sangvi village near Bhatgar—*vide* G. R. No. 1849/27, dated 5th January 1932.

(9) The supply of water to the road side trees, etc., is charged as follows :—
Rs. 10 per 100 Nos. for trees, planted along field boundaries, roadsides, etc.
Re. 1 per 100 Nos. of seedlings, shrubs, etc.

(10) Long term fruit trees on the Nira Right Bank Canal are charged at half rates for the first five years from the date of their plantation, *vide* G. R. Nos. 2353/27, dated 13th December 1932.

(11) Short terms, cane and other perennials are charged in accordance with the scales laid down in G. R. Nos. 8670, dated 13th January 1927 and 3098/27 dated 6th November 1929 and 5602/27, dated 4th December 1935.

*Lands wholly assessed at consolidated rates.
§Block rate for blocks in 1 : 3 proportion of sugarcane.
¶Block rate for blocks in 1 : 4 proportion of sugarcane.
**For single watering for crops for which no application for irrigation throughout the season was received.

A—For sugarcane and pan gardens.

B—For perennial crops other than sugarcane.

C—For pan gardens for the whole year. If water is given for part of the year the charge will be on the basis of thrice the medium seasonal rates for the seasons concerned—*vide* G. R. No. 5602/27, dated 9th December 1931.

D—For rice.

E—For crops other than rice.

K—For pomegranates

M—For sugarcane.

X—For sugarcane and pan gardens double the seasonal rates and for other perennial crops single seasonal rates shall be charged.

(*c*) On the Matoba tank the rates for sugarcane is the rate in force on irrigation works for short term cane.

(*d*) Rates sanctioned in G. R. No. 5602/27, dated 3rd December 1935.

(*e*) The single-watering rate applies to one pre-seasonal or post-seasonal watering to a santioned crop. If more than one such watering is taken, the full seasonal rate will be charged unless specifically ordered otherwise. The single watering rate is not applicable to seasonal irrigation.

(*f*) For sugarcane the short-term cane rates as per scale sanctioned in G. R. No. 8670, dated 13th January 1927, (which may be in force on major irrigation works), for pan gardens the same rate as on the Mutha Canals and for other perennials single medium seasonal rates will be charged—*vide* G. R. No. 5602/27, dated 9th December 1931.

(*j*) From 15th June to 14th October.
(*k*) From 15th October to 14th June.
(*l*) From 15th February to 14th June.
(*m*) From 15th June to 14th October or 15th July to 30th November.
(*n*) From 15th October to 14th February.
(*o*) For four months from 15th June to 15th October or 15th July to 30th November.
(*s*) In force up to 15th February 1942—*vide* G. R. No. 5459/27, dated 29th January 1936.
(*u*) In force up to 14th February 1940—*vide* G. R. No. 1604/36 dated 22nd September 1937.
(*w*) Rates sanctioned in G. R. No. 6095, dated 22nd October 1924 and G. R. No. 3187/27, dated 22nd August 1929 to be in force up to 14th February 1940—*vide* G. R. No. 3187/27 dated 1st February 1935.
(*x*) For sugarcane, betel leaves, etc., for 12 months.
(*y*) For eight months from 15th June to 14th February.
(*z*) For eight months from 15th October to 14th June or 1st August to 31st March.

a Rates to be in force up to 14th February 1938—*vide* G. R. No. 5602/27, dated 4th December 1935.

a^1 Rates sanctioned in G. R. No. 5956/27, dated 26th May 1936.

a^2 Rates sanctioned in G. Rs. Nos. 825, dated 30th August 1924, and 825, dated 1st November 1926, and continued in G. R. No. 2881/27, dated 4th July 1929, are further continued up to 14th February 1940—*vide* G. R. No. 2881/27, dated 9th July 1934.

a^3 Rates to be in force up to 31st July 1938—*vide* G. R. No. 679/27, dated 11th October 1932.

a^4 Rates to be in force up to 15th June 1940—*vide* G. R. No. 2894/27, dated 1st June 1934.

a^5 Rates sanctioned in G. Rs. Nos. A-1-309, dated 15th February 1911, 5412, dated 15th December 1926, 2835/27, dated 4th October 1929, are to be in force up to 15th June 1940—*vide* G. R. No. 2835/27, dated 2nd July 1934.

a^6 Rates to be in force up to 14th February 1940—*vide* G. R. No. 2691/27, dated 9th July 1934.

a^7 For ordinary rabi.

a^8 For restorative crops grown after rice.

a^9 In either kharif or rabi season.

a^{10} Rates sanctioned in G. R. No. 293/27 of 29th January 1936, are to be in force up to 31st March 1942.

(b^1) Rate for perennial 12 months.

(b^2) Rate for perennial 8 months from 15th June to 14th February.

(b^3) Single seasonal rates are charged—*vide* G. R. No. 3343/27, dated 8th October 1929.

Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches of the P. W. D. from the year 1921-22 to 1937-38 and the percentage on the total outlay on works and repairs during that period in both the Branches.

Year.	Expenditure on Establishment in the Roads and Buildings Branch.							Expenditure on Establishment in the Irrigation Branch.
	50—Civil Works—Provincial.	81—Civil Works.	50—Civil Works—Central.	8—Military Works.	Deposit Works.	Total Establishment charges.	Percentage on the total outlay on works and repairs in the Roads and Buildings Branch.	68—Construction of Irrigation, Navigation, Embankment and Drainage Works.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.
1921-22 ..	29,06,955	..	1,98,683	45,258	2,84,992	34,35,888	19·26	11,53,734
1922-23 ..	20,14,640	8,34,450	1,78,163	71,481	77,143	31,75,877	20·79	14,20,751
1923-24 ..	15,84,488	8,10,645	67,892	38,560	6,88,354	31,89,939	19·88	21,87,793
1924-25 ..	16,89,892	12,25,632	1,19,721	27,862	2,52,556	33,15,663	19·67	29,10,785
1925-26 ..	18,89,417	12,05,078	1,01,876	69,049	2,58,535	35,23,955	20·66	32,21,647
1926-27 ..	25,30,286	5,97,486	1,68,896	5,882	3,94,389	36,96,939	23·76	35,56,959
1927-28 ..	21,99,448	5,59,107	1,49,132	5,042	2,97,270	32,09,999	24·96	36,98,956
1928-29 ..	22,40,393	6,56,713	2,29,540	2,240	2,56,180	33,85,066	25·03	39,04,670
1929-30 ..	22,45,450	7,33,867	1,56,773	3,638	2,34,897	33,74,625	25·26	42,26,873
1930-31 ..	25,51,711	1,80,139	1,72,163	2,415	85,444	29,91,872	32·35	42,88,966
1931-32 ..	25,93,104	2,32,929	1,22,799	3,182	44,132	29,96,146	38·70	40,37,972
1932-33 ..	23,74,603	71,981	85,143	3,334	17,156	25,52,217	39·79	28,70,427
1933-34 ..	22,73,945	31,807	71,866	3,810	30,502	24,11,930	37·97	17,60,090
1934-35 ..	21,88,729	38,278	62,472	2,693	47,694	23,39,866	35·82	15,36,830
1935-36 ..	20,51,807	808	89,984	1,539	54,593	21,98,731	35·75	1,37,301
1936-37 ..	23,14,593	619	61,859	1,124	57,679	24,35,874	31·66	74,021
1937-38 ..	22,61,828	699	58,352	998	47,319	23,47,689	24·46	68,679

Year.	Expenditure on Establishment in the Irrigation Branch.						Percentage on the total outlay of works and repairs in the Roads and Buildings and Irrigation Branches.
	XVII-Works for which capital accounts are kept.	18—Other Revenue Expenditure financed from Ordinary Revenue.	Deposit works.	Total Establishment charges.	Percentage on the total outlay on works and repairs in the Irrigation Branch.	Total Establishment charges in the Roads and Buildings and Irrigation Branches.	
1	10	11	12	13	14	15	16
	Rs.	Rs.	Rs.	Rs.		Rs.	
1921-22 ..	13,85,960	6,68,651	2,770	32,11,115	33·59	66,47,003	24·26
1922-23 ..	13,44,901	5,34,327	1,993	33,01,972	32·22	64,77,849	25·38
1923-24 ..	14,43,222	4,32,013	2,056	40,65,084	33·89	72,55,023	25·87
1924-25 ..	17,37,724	5,26,361	492	51,75,362	28·73	84,91,025	24·35
1925-26 ..	17,99,343	5,19,228	2,681	55,42,899	21·62	90,66,854	21·23
1926-27 ..	18,08,385	5,94,989	3,207	59,63,540	30·56	96,60,479	27·54
1927-28 ..	19,20,773	7,80,312	3,847	64,03,888	26·00	96,13,887	25·64
1928-29 ..	21,35,939	6,16,601	2,750	66,59,960	25·51	1,00,45,026	25·35
1929-30 ..	21,08,302	6,18,312	1,012	69,54,499	23·26	1,03,29,124	23·88
1930-31 ..	18,31,149	5,99,621	1,734	67,21,470	21·60	97,13,342	24·06
1931-32 ..	16,34,011	5,18,627	86	61,90,696	22·40	91,86,842	25·97
1932-33 ..	23,53,971	4,01,329	680	56,26,407	28·54	81,78,624	31·30
1933-34 ..	29,83,531	5,14,407	48,960	53,06,988	40·41	77,18,918	39·61
1934-35 ..	30,98,255	4,55,037	441	50,90,563	42·89	74,30,429	40·38
1935-36 ..	8,66,476	1,73,501	61	11,77,339	89·46	33,76,070	45·21
1936-37 ..	8,24,868	1,63,507	620	10,63,016	83·73	34,98,890	39·04
1937-38 ..	7,70,784	1,27,039	73	9,66,575	82·27	33,14,264	30·77

NOTE.—The percentage of the establishment charges on the cost of works and repairs in the Irrigation Branch (column 14) is generally higher than that in the Roads and Buildings Branch (column 8). The reason is largely that the establishment charges in the Irrigation Branch include the cost of Special Revenue Establishment employed entirely on "revenue management" work on certain canal systems which has no connection with the execution of works and repairs, and that these charges also include cost of part of the time of Irrigation establishment spent on revenue management including the *control and distribution of water*, which is debited in the accounts to "revenue management" and not to execution of works and repairs. If these establishment charges debited in the accounts to "revenue management" are deducted from the total cost of establishment in the Irrigation Branch the percentage on the cost of works and repairs will not be so divergent. The increase in the rate per cent. in the R. & B. Branch is mainly due to decrease in outlay on "works" and "repairs". Establishment charges cannot be reduced in the same ratio in which expenditure on works is reduced A mere overall percentage on expenditure on works is inaccurate.

The figures from the year 1921-22 to 1934-35 pertain both to the Province of Bombay and Sind.

Administration Report of Irrigation Works in the Province of Bombay for the year 1937–38 : Review of—.

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. P. 22.

Bombay Castle, 2nd December 1938.

RESOLUTION OF GOVERNMENT.

The Irrigation works dealt with in this Report which covers the period from 1st April 1937 to 31st March 1938 fall into two categories, viz. (*i*) Tanks and canals for which Capital and Revenue Accounts are kept, and (*ii*) Small tanks, bandharas and drainage channels, for which neither Capital nor Revenue Accounts are kept. The works included under (*i*) are described in detail in Section I of the Report. The works mentioned under (*ii*) are small and numerous and a brief account of them is given in Section II of the Report.

2. The total capital outlay on works for which Capital and Revenue Accounts are kept, to the end of the year under review, amounted to Rs. 10,77,07,316.

Including an area of 8,622 acres, on which a consolidated water and land assessment is levied, the total area irrigated was 316,585 acres, as compared with 313,973 acres, in the previous year.

The gross assessed revenue amounted to Rs. 33,83,235 compared with Rs. 34,77,222 during the previous year and Rs. 29,49,143, the average of the past three years.

The unrealised balance of revenue demands at the close of the year amounted to Rs. 18,45,858. A portion of this amount has since been recovered and steps have been taken to effect the early recovery of the balance outstanding.

The working expenses amounted to Rs. 16,26,519 compared with Rs. 17,29,930 in the previous year.

The net revenue (after deducting working expenses) amounted to :—

	Rs.
(*i*) On the basis of assessment	17,56,716
(*ii*) On the basis of realisations	16,09,376

gitized with financial assistance from t
Government of Maharashtra
on 22 July, 2017

as compared with Rs. 17,47,292 and Rs. 13,36,711, respectively, during the previous year.

The statement embodied in paragraph 13 of the Report shows the financial results of the more important works for which Capital and Revenue accounts are kept.

3. The total area irrigated by works for which neither Capital nor Revenue accounts are kept was 168,500 acres, and the gross revenue realised was Rs. 7,39,591. The total expenditure incurred on improvements and repairs, inclusive of the collection charges, amounted to Rs. 4,75,792.

By order of the Governor of Bombay,

U. N. MAHIDA,
Deputy Secretary to Government.

To

The Finance Department.
The Revenue Department.
The Commissioner, Northern Division.
The Commissioner, Central Division.
The Commissioner, Southern Division.
The Director of Land Records.
The Director of Agriculture.
The Commissioner of Labour and Director of Information.
All Superintending Engineers of Circles.
All Collectors (except those of Bombay and Bombay Suburban, Thana and Kolaba Districts).
The Accountant General, Bombay.
All Executive Engineers in charge of Irrigation Works.
The Secretary to the Governor of Bombay.
The Secretary to the High Commissioner for India (by letter).

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.